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FISCAL CONSTRAINTS AND THE P-3
FLIGHT HOUR BUDGET

by

William R. Blake, Jr.

June 1988

Thesis Advisor:

Lawrence R. Jones

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Fiscal Constraints and the P-3
Flight Hour Budget

by

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Submitted in partial fulfillment of the
requirements for the degree of

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I. INTRODUCTION

A. BACKGROUND

By far the most important reform is the recasting of budgets and accounts to reveal the costs of meaningful end-product missions or programs, rather than the costs of classes of objects. Economic analysis is concerned with objectives, not objects; it can identify efficient programs for achieving objectives only if it can relate costs to such programs. [Hitch and McKean 1986, p. 233]

The importance of understanding the costs of programs and their priority within an organization is becoming more critical for all levels of management within the Department of Defense (DOD). Political pressure is mounting within Congress and the Executive branch to balance the budget to gradually eliminate the nation's deficit. The deficit peaked in FY86 at \$221 billion as the total U.S. government debt went beyond two trillion dollars. Defense immediately became a target for cuts in budget authority and appeared ripe for longer-term reduction of outlays not only because its budget is so large, but also because it has grown so rapidly in recent years [Kaufman 1986, p. 33].

A major factor influencing the defense budget is the Balanced Budget and Emergency Deficit Control Act of 1985 (revised 1987 by Public Law 100-119), more commonly known as the Gramm-Rudman-Hollings (GRH) Act. GRH is a deficit reduction plan that provides specific goals for eliminating the deficit by fiscal year 1993. This law could have

disastrous effects on the Department of Defense and its operating funds, particularly the Operations and Maintenance, Navy (O&M,N) appropriation and the Military Pay, Navy (MPN) appropriation. The reason these two appropriations are more at risk than procurement or even research and development will be explained later in a discussion of the Gramm-Rudman Act.

The primary purpose of this thesis is to research the type of management, accounting, and information systems that become more valuable in an era of deficit control and budget reduction. Decision makers in federal government and particularly in DOD are facing a minimum of five years where they are confronted with "cutback management." In a book on financial stress, Levine defines cutback management as "...making and implementing hard decisions about...which programs and agencies will be scaled down or terminated and which clients will be asked to make sacrifices." [Levine 1980, p. 11] In another article on financial crisis, Jones says that few public managers and analysts have experience in cutback management and are in need of information on options for management [Jones 1984, p. 49]. For the first time in this decade, military leaders and managers will be in a position where there is no real growth in defense. At all levels of the government and military, hard decisions are going to be made on whether to make across-the-board or vertical cuts in programs.

Hopwood says that a period of constrained resources places renewed emphasis on costs, financial information and the calculus of economic decision making [Hopwood (undated), p. 171]. Financial standards, budgets and plans become more detailed and more subject to change. Accounting systems are looked to for indications of efficiency and cost effectiveness. A Government Accounting Office (GAO) report in December 1987 concerning the Federal Managers Financial Integrity Act noted that "...there is general recognition today that most of the government's accounting systems are generally outmoded, inefficient and ineffective and that improvements in financial management are urgently needed." [U.S. General Accounting Office 1987B, p. 34] The report goes on to say that the federal government has continued to rely on antiquated accounting systems that were designed in World War II and, therefore, do not provide the information required for effective management and decision making.

This thesis centers on one of many military organizations that could feel the impact of Gramm-Rudman and must plan for a tighter operational budget over the next five years. The Flight Hour Program (FHP) for Commander, Patrol Wings U.S. Pacific Fleet (CPWP) is a part of the Navy's Operations and Maintenance network and is the focus of this thesis. The admiral in charge of CPWP has command of 12 operational squadrons flying approximately 110 Lockheed P-3 Orion aircraft whose primary mission is long range

antisubmarine warfare. The squadrons are based at Naval Air Station, Moffett Field, California and at Naval Air Station, Barbers Point, Hawaii. Four squadrons are always deployed to sites throughout the Pacific and Indian Oceans. An organizational diagram is included in the next chapter.

The financial support for squadron aircraft is divided into two primary Operational Functional Categories (OFCs): (1) OFC-01 or Flight Operation funds are primarily the fuel required for flight operations, and (2) OFC-50 or Aviation Fleet Maintenance (AFM) funds are for aircraft consumables used in maintaining the aircraft. This thesis is concerned with Flight Operation funds, a sum which amounted to 45 million dollars in FY87 for the CPWP squadrons [COMNAVAIRPAC JUL87, p. 1]. These funds are commonly referred to as the squadron's OPTAR (operating target).

The OPTAR for squadron programs is received by CPWP in a quarterly lump sum from the Commander, Naval Air Forces, U.S. Pacific Fleet (CNAP). These flight funds are then allocated by CPWP to each squadron based on a number of factors that are discussed later. The primary objective is to achieve the highest degree of operational readiness based on the funds available.

The Reagan era provided the opportunity for the nation's defense to increase readiness throughout the fleet and CPWP was no exception. Mission capability rates increased to the highest levels ever, reflecting increased funding for spare

parts, avionics improvement programs, and quality training for both maintenance and aircrew personnel. Mission capability for all Navy aircraft increased from an average of 59% in FY80 to 74% in FY86. An aircraft is considered mission capable if it can perform at least one of its primary missions. [U.S. Congress 1987B, p. 648]

With budget deficit control now a national priority and defense a primary target for cutbacks, improvements in readiness are threatened and managers are faced with difficult decisions. Decisions are going to be made on whether to make across-the-board cuts in programs, eliminate programs, decrease the number of crews per squadron, reduce support at some deployment sites, or any number of other options.

This thesis explains why there should be concern with Gramm-Rudman and then examines a variety of factors that effect the strategic planning of a military organization. These factors include aspects such as financial stress, management control systems, accounting, and organizational structure. Knowledge gained through research in these areas should help answer the following research questions:

1. How does a military organization such as CPWP prepare for an era of Gramm-Rudman budget deficit control?
2. How does the current management control and accounting system for the P-3 flight hour program compare with an alternate system based on end-product missions?
3. Does the current budget formulation and execution system for the flying hour program contribute to the most efficient use of resources?

4. Does an end-product, mission oriented accounting system provide senior management with the information needed to make budget decisions that impact readiness?
5. Is there sufficient variance in the fuel usage of different missions to justify instituting an accounting system that will establish a standard cost per hour from which more accurate program cost can be determined?
6. What characteristics in a military non-profit organization make the implementation of a management control system more difficult than a profit oriented company?

B. SCOPE

This thesis uses an operations and maintenance fund, the flight hour program, to examine what characteristics are important for an organization that is facing an extended period of budget constraints. Although applicable to other operational segments of the military, this research focuses on the 12 squadrons under the control of CPWP. The proper level of funding for the flight hour program is a major factor in achieving readiness standards. Other factors directly affecting readiness include manning, availability of spare parts, funding for maintenance consumables, and proper training of personnel. These and other factors are important contributors to readiness; however, they are not part of the scope of this thesis.

There is a much larger flight hour control system at levels above CPWP, such as CNAP and the Chief of Naval Operations for Air Warfare (OP-05). These systems involve a multitude of different aircraft and are not the subject of this thesis. The major area examined outside of CPWP is

Congressional action on the budget deficit and its impact on DOD's appropriations.

Beyond examining the current budget formulation and execution system, this thesis develops an alternative model for control and accounting that concentrates on end-product missions. The P-3 has more than 30 types of missions that are flown each year. This thesis will not determine the estimated cost of each mission because that is not the objective of the research. Rather, an accounting system for collecting the needed cost information is proposed.

Samples of the hourly cost for several different mission profiles are analyzed to determine whether there is sufficient variance in cost per hour to warrant establishing an hourly standard for similar missions vice using the annual funding rate.

C. METHODOLOGY

This section describes the steps that were taken in researching the thesis. The concept of using end-product missions originated from a policy analysis textbook that proposed using that method for future accounting systems [Hitch and McKean 1986, p. 233]. This in combination with material from a management control course [Anthony, Dearden, and Bedford 1984], a cost accounting course [Horngren and Foster 1987] and a management policy course [Hosmer 1982] provided the idea that the current system might be improved.

CPWP flight hour studies and previous theses are used as a base for analyzing the current system of flight hour budgeting and management control [Bozin 1981; Burton 1982; Murray 1986]. A literature search of management control led to studies of non-profit organizations, organizational responses to financial stress, accounting systems, and a current issue, the Gramm-Rudman Act. All of these aspects are directly applicable to what is going to affect the financial management horizons of a military organization over the next five years. An understanding of the alternatives available is critical for today's leadership due to the need to maintain productivity with fewer resources.

D. ORGANIZATION

The thesis is divided into six chapters. Chapter I provides an introduction and general sketch of the issues.

Chapter II describes the CPWP organization and the flow of funds for the operations and maintenance account. The chapter discusses the budget formulation and execution program, the associated financial and management reports, and the program structure in the CPWP organization. This sets the framework for how management control and accounting systems function in the flight hour program.

Chapter III describes the Gramm-Rudman Act and shows its relationship to the Department of Defense and its appropriation accounts. An understanding of this legislation is

critical for all federal government managers and leaders. The law is likely to have dramatic effect on DOD's budget over the next five years. Chapter III also explains why federal managers should be concerned.

Chapter IV discusses important aspects of financial stress and cutback management that accompany deficit control measures like Gramm-Rudman. The characteristics of financial stress along with a model describing an organization's reaction to phases of stress are presented. The problem of facing reduced budgets has been explained as follows

The dilemma in facing cutbacks in the public sector results in large part from the fact that over the past thirty years our society and economy have become accustomed to and dependent upon growth in government.
[Jones 1984, p. 49]

Chapter IV also examines the characteristics of public and non-profit organizations and takes a look at management control systems for government. Military organizations do not have traditional measures of performance such as profit. This creates difficulties in measuring performance and determining whether resources were used efficiently. In addition, this chapter relates various aspects of management to the system used by CPWP.

Chapter V provides a discussion of accounting and management information systems. A program structure is proposed and compared against the current system at CPWP. The pros and cons of using a management information system to collect the necessary accounting data are discussed. The

cost per hour for several different mission profiles are examined from a statistical viewpoint to determine if the accumulation of variances from an overall cost per hour is necessary or useful.

Chapter VI presents conclusions and makes recommendations on how an organization such as CPWP can prepare for an era of budget constraints and control. Knowledge of alternatives is important when difficult financial choices have to be made; this thesis discusses a number of the factors which have an impact on such choices.

II. CPWP

The purpose of this chapter is to describe the CPWP organization, its budget formulation and execution system, the financial reports used in executing the budget, and the programs in the flight hour program. An understanding of the organization and its flow of funding is necessary since particular aspects of this system are addressed throughout the remainder of the thesis.

A. ORGANIZATION

This section describes an organizational structure for CPWP and the flow of funds through associated commands. This facilitates the later discussions of budgets and control systems. Like all other appropriations, the Operations and Maintenance, Navy (O&M,N) account goes through a complicated Congressional negotiation process prior to its approval in an Appropriations Act. The following paragraphs provide a brief description of what happens to funds after Congressional approval and how they get to the end user.

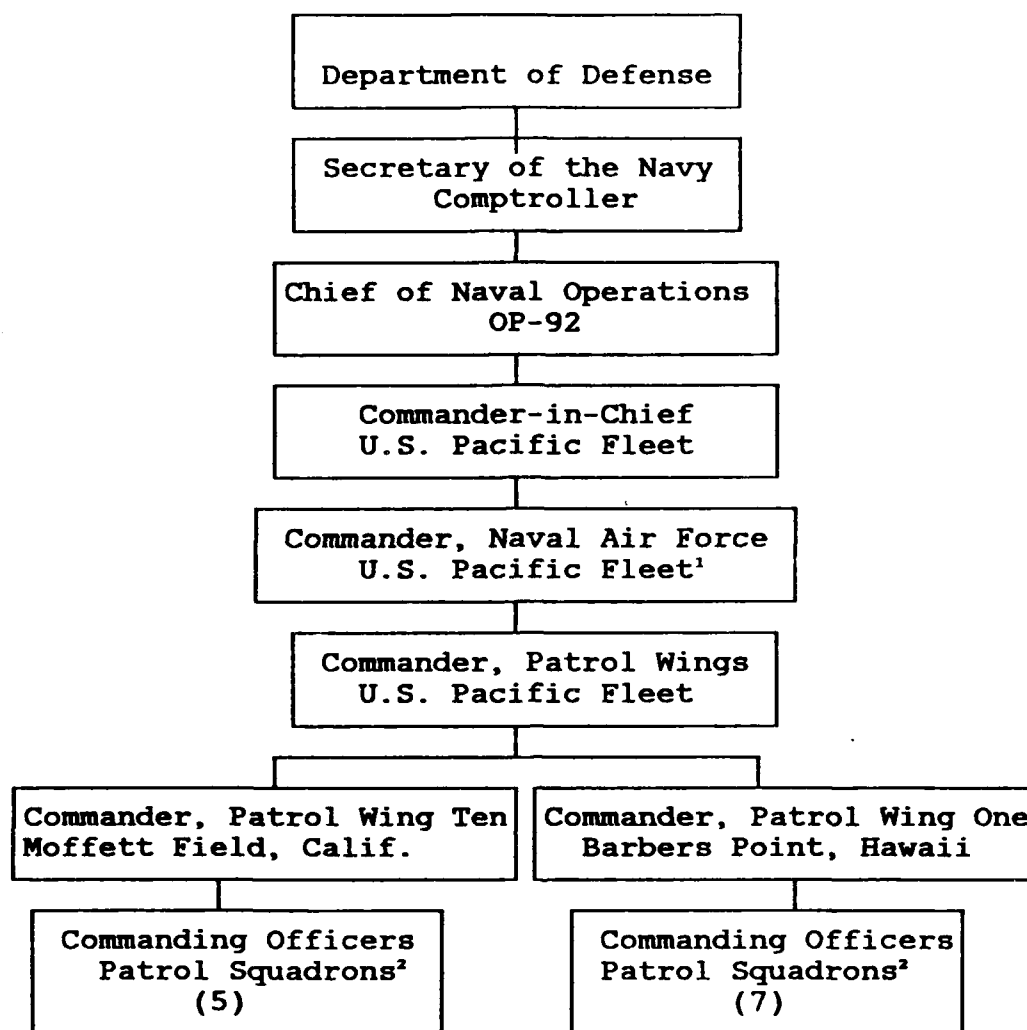
Once passed as a law by Congress, the Treasury department issues Appropriation Warrants to the General Accounting Office (GAO) for countersignature to ensure agreement between the executive and legislative branches prior to execution. Each warrant identifies the amount for a particular appropriation and any restrictions placed on

the account by Congress. These warrants make the appropriated funds available for apportionment by the Office of Management and Budget (OMB). The apportionment process determines the maximum amount of money that can be obligated during a specific time frame, i.e., some funds must spend all of the money during a particular fiscal year while others, such as procurement, are spread over several years with spending caps for each year. The apportionment process provides O&M,N funds on a quarterly basis. These sums are typically different for each quarter to provide control over spend-out rates for the various appropriations. An allocation process dominates the remaining distribution of funds commencing with the Department of Defense as shown in Figure 1 on the next page. [Practical Comptrollership Manual 1988, p. A-27]

The allocation of resources for commands above CPWP is more difficult from the standpoint that funds must be divided between a large assortment of aircraft and ships. The budget formulation process provides a starting point for the allocations of O&M,N funds. The method for determining the financial needs of patrol squadrons is discussed below.

B. BUDGET FORMULATION

The flight hour and budget requirements for aviation squadrons revolve around a concept called Primary Mission Readiness (PMR): the average number of flight hours required per crew per month for a complete 18 month training and



¹Responsibility center and is the Operating Budget Holder (OPBUD). Lowest level holding legal spending limits.

²Cost Center with administrative vice legal limitations. Issued Operating Targets (OPTAR).

Source: Diagram partially adapted from [Practical Comptrollership Manual 1988, p. A-28]

Figure 1. Flow of Operations & Maintenance Funds
[Practical Comptrollership Manual 1988, p. A-28]

deployment cycle. Derivation of PMR is not addressed to keep the thesis unclassified. For the purpose of this thesis this information is unnecessary. The annual requirements for the CPWP OPTAR can be determined in the following manner:

$$\text{Annual Flight Hours} = \text{PMR} * (12 \text{ crews/sqd.}) * (12 \text{ squadrons}) \\ * (12 \text{ months/year})$$

$$\text{Annual Funding} = \text{Annual Flight Hours} * \text{Cost per flight hour}$$

The cost per flight hour is determined by the DOD contracted fuel price for the year multiplied by the historical average of gallons per flight hour used by each model of the P-3 aircraft.

PMR is the "average" monthly flight hour requirement over a complete 18 month training and deployment cycle. The 12 patrol squadrons are in one of three phases at any given time. A squadron is either deployed, in a ready/alert status, or in training. Flight hours for each of these phases are divided into operational and training requirements. The estimated operational requirements for each phase are determined by historical data. The training hours are supported by an extremely detailed breakdown of squadron training needs. One way to understand the cycle requirements and how they relate to training and operations hours is to use the matrix shown in Table 1.

The required flight hours per crew per month for each phase of employment is different and varies from the 18

TABLE 1

FLIGHT HOUR MODEL FOR VP SQUADRON

Squadron Phases for 18 Month Cycle			
	Deployed	Ready Alert	Training
Training Hrs.	A	B	C
Ops Hrs.	D	E	None
Total Monthly Hrs	A + D	B + E	C
Hrs/Crew/Month	(A+D)/12	(B+E)/12	C /12

month cycle average--PMR. Funding levels for each of the employment phases are commonly expressed as a percentage of PMR. If budgeted at the readiness and operational levels required in the PMR studies, the following amount of flight hours per crew per month would be funded:

Deployed = PMR * 136%

Ready Alert = PMR * 107%

Training = PMR * 67%

Now that some of the basic elements of the budget formulation process have been presented, a discussion of budget execution is in order.

C. BUDGET EXECUTION

Budget execution for CPWP and its 12 squadrons is like that employed by many government agencies. A lump sum is

allocated to support an organization whose services are unique and output is heterogeneous, hard-to-define and very difficult to measure [Jones and Thompson 1986, p. 39].

The allocation of flight resources from Commander, Naval Air Force, U.S. Pacific Fleet (CNAP) to CPWP is based on three factors: a percentage of PMR, the historical gallons per hour used for each type aircraft, and the contracted DOD cost of fuel. The key variable in this computation is the percentage of PMR to be funded. Under normal circumstances, and particularly during a period of financial constraints, this percentage will be less than the desired 100%. The reason the cost of fuel is not considered as much of a key variable is that Public Law 100-180 which controls the DOD appropriation says under the O&M section that additional sums are authorized for: (1) unbudgeted increases in fuel cost and (2) unbudgeted increases as a result of inflation in the cost of activities [Congress 1987B]. Without such a provision in the appropriation act, fluctuations in oil prices would be a volatile factor in determining the flight hours available to meet mission needs.

In effect, CPWP competes for funding along with the other large aviation commands under CNAP. According to Jones and Thompson, such competition, "...is viewed as competition for the market vice competition in the market." [Jones and Thompson 1986, p. 37] Anthony and Young reinforce this idea by saying that in the absence of a

market mechanism for allocating resources, the manager's objective in a public supported non-profit organization is, "...to get as large a slice as possible of the...pie." [Anthony and Young 1984, p. 46] Senior management, such as CNAP, must judge what services are in the best interest of the public, rather than responding to specific market demand signals.

The allocation of O&M,N funds by operational commanders is a continuous process because of the practice of quarterly apportionment by OMB and also due to the uncertain outcomes of the budgetary process. This lack of long-term funding precludes meaningful long-range planning. Planners are forced into a continuous "what if" scenario developing numerous budgeting contingencies.

CPWP receives an annual planning figure (APF) from CNAP at the beginning of each fiscal year which is then modified once the appropriation bills are passed by Congress. The accuracy of this figure depends on a multitude of factors including budget stability, Gramm-Rudman initiatives, and fluctuating demands on military resources as created by the Persian Gulf or Central America. A paragraph from a CNAP November 1987 message to CPWP best describes the budgetary uncertainty involved:

There are still significant uncertainties and pressures on the Flying Hour Program. The 70K hour APF may be unsupportable within the FHP resources provided to CNAP. Request continued efforts to ensure VP aircrews receive necessary and appropriate levels of training to

successfully carry out assigned missions. [COMNAVAIRPAC NOV87, p. 1]

CNAP's quarterly OPTAR allocation authorizes CPWP to distribute financial resources to squadrons. On a smaller scale, CPWP is faced with many of the same allocation decisions as CNAP. CPWP must decide which allocation method optimizes force readiness. In a time of financial constraints, this requires decisions on whether to terminate programs, make across-the-board cuts, reduce deployment commitments, or use some combination of these initiatives. A discussion of cutback alternatives is included in Chapter IV on financial stress.

The position of Commander, Patrol Wing Ten (CPW-10) and Commander, Patrol Wing Two (CPW-2) are in the organizational diagram at the beginning of this chapter. They are an extremely important intermediary between CPWP and the squadrons. Although not formally involved in budget allocation and execution, they provide major inputs to the decision making process concerning all aspects of the flight hour program. The commander of each wing is the primary evaluator of squadron performance and signs the fitness reports for the squadron commanding officers. The squadron commanding officer does not formally report to the wing commander for budget execution. Therefore, financial management is not normally one of the factors upon which a commanding officer is judged. That this appears to be a flaw in the management control system was a major point in

previous theses on the flight hour program [Bozin 1981, Burton 1982, Murray 1986].

The end user of flight hour funds is the squadron which must utilize the financial resources provided by CPWP to maintain the highest possible readiness. Readiness is designed to measure how effectively and efficiently the squadron utilizes its assets and financial resources. As mentioned previously, readiness is a measure of a number of factors including utilization of the flying hours, training, manning, material condition of capital assets, and availability of spare parts. Because there are so many inputs and only one measure of output, it is difficult to measure how efficiently resources of individual inputs are used.

The flying hour program is one of the inputs that has no singular measure of performance. There is no good measure of how efficiently the squadron's OPTAR funds are spent. It is difficult to tell how much readiness is achieved per flight hour and what types of flights contribute the most to overall readiness. The flight hours used are not compared to PMR, the budget formulation model for flight hours.

The quarterly allocation provides both an authorization for hours and money. This is meant to cause the squadrons to fly efficiently. The dollar figure is based on a calculation involving historical fuel usage, the hours granted, and the cost per gallon of gas. A derived cost per

hour figure results from the statistical analysis of historical fuel usage combined with the current cost per gallon. Although this figure is used in squadrons as a management tool for controlling the overall flight hour program, it is meaningless as a measure of efficiency for individual flights. Squadrons fly more than 30 different missions which means numerous flight profiles and varying levels of fuel usage. If a squadron is flying more "efficiently" than the historical trend, more hours can be granted to ensure all the funds are spent. However, the opposite is not true. A squadron flying above the historical cost per hour will generally not be given the additional funds required to fly the remaining hours. The objective is to have zero funds and zero hours left at the end of the quarter without any over-obligation. As Anthony and Young state, "...the ideal financial performance in a non-profit organization is a break-even one." [Anthony and Young 1984, p.41]

Budgets with a spending limit, the goal of a zero balance, and no standards for efficiency are generally the result of a fiduciary type accounting system. Anthony and Young describe fiduciary accounting as a system that "keeps track of the funds entrusted to an organization to ensure that they were spent honestly." [Anthony and Young 1984, p. 55] This type of accounting still exists in some government organizations and is associated with outdated accounting and

budgeting systems. As pointed out in a December 1987 GAO report, the government's accounting and budgeting systems "...are generally outmoded, ineffective, and inefficient." [U.S. General Accounting Office 1987B, p. 34] Generally, the principles that distinguish modern systems from the fiduciary type accounting are the accrual concept, cost accounting, standard costing, variance analysis, budgeting and responsibility accounting [Anthony and Young 1984, p. 55]. Some of these items are discussed later in Chapter V on accounting and information systems.

D. BUDGET REPORTS

The reporting network for the flight hour program involves informal ten day reports that remain in the squadron, a monthly Budget OPTAR Report (BOR) for CNAP and the Fleet Accounting and Disbursing Center, Pacific (FAADCPAC), and a mission summary sheet that goes to CPWP.

The ten day report is generated on the 10th, 20th, and last day of each month for the Commanding Officer since he is held accountable for the proper expenditure of funds. The report summarizes the flight hours and cost per hour for the last ten days, the month to date, quarter to date, and fiscal year to date. This report is the Commanding Officer's management tool for monitoring the flight hour program.

The monthly BOR is the only flight hour funding report that leaves the squadron. Although the report goes to

FAADCPAC, the comptroller at CNAP is the funding manager most interested in its content and accuracy. This is because CNAP is the responsibility center for the O&M,N account and, therefore, legally accountable for budget execution of the Flight Hour Program [Practical Comptrollership Manual 1988, p. A-29]. An important standard for budget control, subsection 1517 of 31 USCA "...prohibits any officer or employee from making or authorizing an obligation in excess of the amount available in an appropriation...." [Practical Comptrollership Manual 1988, p. A-4] Under-obligation is not as severe a problem since a small carryover is allowed for the first three quarters of the fiscal year. Repeated under-obligation is generally viewed as poor management that may result in a cutback in funds due to lack of need. The reporting of budget execution by squadrons skips two levels in the chain of command to expedite the accumulation of financial information. In fact, the BOR is due no later than the 2nd day of the month following the month being reported.

The mission summary report sent to CPWP delineates the type of missions and the total hours flown in each category. This information is summarized into five general mission categories and forwarded to CNAP: (1) training, (2) exercise, (3) operational, (4) service, and (5) contingency. CNAP in turn summarizes the same data for all types of aircraft under its control and forwards the information to

the Chief of Naval Operations (OP-51C) [COMNAVAIRPAC APR87, p. 1].

E. PROGRAM STRUCTURE

The members of the naval aviation community continually examine the trends in modern warfare and evaluate methods for coping with an ever-changing environment. Alternatives are proposed to deal with uncertainties and future threats. Current assets and financial trends are examined to determine what strategy should be adopted to solve a particular problem. The question frequently arises as to whether to modify a current weapons platform or seek funds for the development of a new system.

The P-3 aircraft has existed for approximately 30 years and is still in production [U.S. General Accounting Office 1987D, p. 3]. Because of its long range, endurance, speed and size, the P-3's role has expanded considerably in response to a changing environment. The primary missions remain long-range antisubmarine warfare and ocean surveillance; however, numerous other missions now consume scarce resources. A P-3 crew could be preparing for any of over 30 different type flights. Missions and programs are added, but few are ever eliminated. "Programs tend to go on forever unless they are subject to periodic, hard headed reexamination." [Anthony and Young 1984, p. 561] Nonprofit organizations have an inclination to progressively expand their responsibilities, eventually losing some effectiveness

in the primary missions [Hosmer 1982, p. 426]. Hosmer contends that managers do not think in terms of a focus for that organization; instead, the tendency is to offer multiple combinations of services, recipients and processes, which results in the familiar problem of "...being all things to all people." [Hosmer 1982, p. 426] He goes on to say that "...to create a centralized focus in activities and a potential savings in cost is certainly useful at nonprofit organizations...." [Hosmer 1982, p. 427]

With a diverse number of programs involved, it is important that the leaders and managers in the P3 community know the annual cost of each program. In a time of deficit control, the probability for cutbacks is high and the best alternative may be to cut the programs on the fringe of the P-3's responsibility or those with the least benefit for the cost involved. Another alternative may be to charge agencies for flying missions that are not designated as primary or secondary. This is not an uncommon practice and generally determines whether the program is truly needed. Many of the Navy's test and evaluation squadrons receive the majority of their flight hour funding via this method. [Byrne 1987] As before, this alternative also requires accuracy in the costing of programs.

CPWP collects monthly information on the number of hours flown in each mission. Chapter V of this thesis examines different missions to determine whether there is significant

enough variation in cost per hour to warrant collecting cost per hour for each program. The program breakdown required by CPWP is detailed and contained in Appendix B. Information from this report is summarized into the five general categories mentioned previously and forwarded to CNAP.

F. SUMMARY

This chapter provided an understanding of the CPWP organization and how O&M,N funds are budgeted and reported. The accounting system in many government organizations is outdated and does not encourage the most efficient use of public resources. This trait is more characteristic of the formal flight hour accounting system where an object class is the focus instead of programs. The importance of a financial management information system based on programs instead of object classes will be demonstrated in Chapter V. Additionally, Chapter IV on financial stress, explains why there is an increasing expectation for efficiency, cost effectiveness, and accounting systems when funding is constrained.

The section on program structure and the expansion of mission requirements in P-3 squadrons explained the need for a focus of responsibilities and a review of missions. Based upon this, the question may be posed as whether it is not better to be superb at a few well-defined missions rather than average over a large number? To prevent the expansion

of tasks outside of primary missions, perhaps users of the information should be required to provide funding to support the additional flight operations requested. Pricing of programs may be the only way to control the demands placed on the P-3 aircraft. For example, P-3 squadrons are reimbursed for supporting the Drug Enforcement Agency for all designated drug surveillance flights. There may be other missions where the same approach is applicable.

Operating funds for CPWP and many other military and government agencies could be seriously affected by deficit control measures over the next decade. The usefulness of accounting systems for cost control is likely to become increasingly important in a period of financial constraints.

III. GRAMM-RUDMAN-HOLLINGS ACT

A. BACKGROUND

The same factors that led Congress to reduce the defense budget for fiscal years 1986 and 1987 are present again this year: intense pressure to lower the federal deficit, congressional unwillingness to cut spending on domestic social programs, and the president's refusal to raise taxes. As a result, there is general agreement that the Reagan administration's defense goals will not be achieved. No consensus exists, however, on which of the competing programs deserve priority. [U.S. Congress 1987C, p. 66]

A revised Gramm-Rudman-Hollings Act (G-R-H), formally called the Balanced Budget and Emergency Deficit Control Act of 1987, became Public Law 100-119 on 29 September 1987. Along with the important purpose of increasing the ceiling on the national debt to \$2.8 trillion, the bill reestablished G-R-H initiatives such as annual deficit ceilings and sequestration procedures for the federal budget through FY93.

In a RAND corporation paper on G-R-H, it is noted that "Although the broad outlines of G-R-H are widely known, the details are not well understood." [Gotz 1986, p. 1] This chapter examines the various aspects of G-R-H that are considered important for military leaders to understand. Like most other laws, its implementation is rather complicated, but it does provide a cap on the size of the federal government's annual deficit--outlays minus revenues equals deficit. The definition of these terms and others

involved in the federal budget process are discussed subsequently because they are critical to the understanding of G-R-H.

Deficit control measures are not new to the federal government. The Balanced Budget and Emergency Deficit Control Act of 1985, Public Law 99-177, December 12, 1985, was the first attempt to implement deficit control measures. This law took affect with the FY86 budget and required a balanced budget by FY92. In Senate Budget Committee hearings on 14 July 1987 entitled "New Deficit Estimates and Revising the Gramm-Rudman-Hollings Targets," the chairman of the committee, Senator Chiles, discussed the first years of G-R-H.

Gramm-Rudman-Hollings has been applied to two fiscal years so far. The total deficit reduction has been roughly half the intended annual target of \$36 billion. So we have found a number of problems in these first years under the deficit reduction plan.

First, the original baseline deficit from which all of the reductions were to flow has been inaccurate. The deficit was some \$50 billion higher than the law assumed. That helped make each of the annual deficit targets unrealistic and unreachable. So in effect, the flag was raised higher than we could climb the pole.

Secondly, when the Supreme Court struck down the automatic sequester provision, it took the guard out of the watchtowers, and where automatic sequester had made escape impossible, its removal changed the whole mood in Washington. We suddenly had a sense that there was a way out. Now there is an even more compelling reason for putting the force back in the law. [U.S. Congress 1987C, p. 1]

The revised Gramm-Rudman deficit control law enacted in September 1987 corrected both of the problems discussed by Senator Chiles. The budget deficit targets were revised to

reflect more realistic targets with a goal of zero deficit by FY93 and the automatic sequester was revised to meet legal requirements. The law now had teeth and could dramatically affect the Department of Defense which is required to absorb 50% of any required outlay reductions. Before explaining about G-R-H, a discussion of budget terminology is needed.

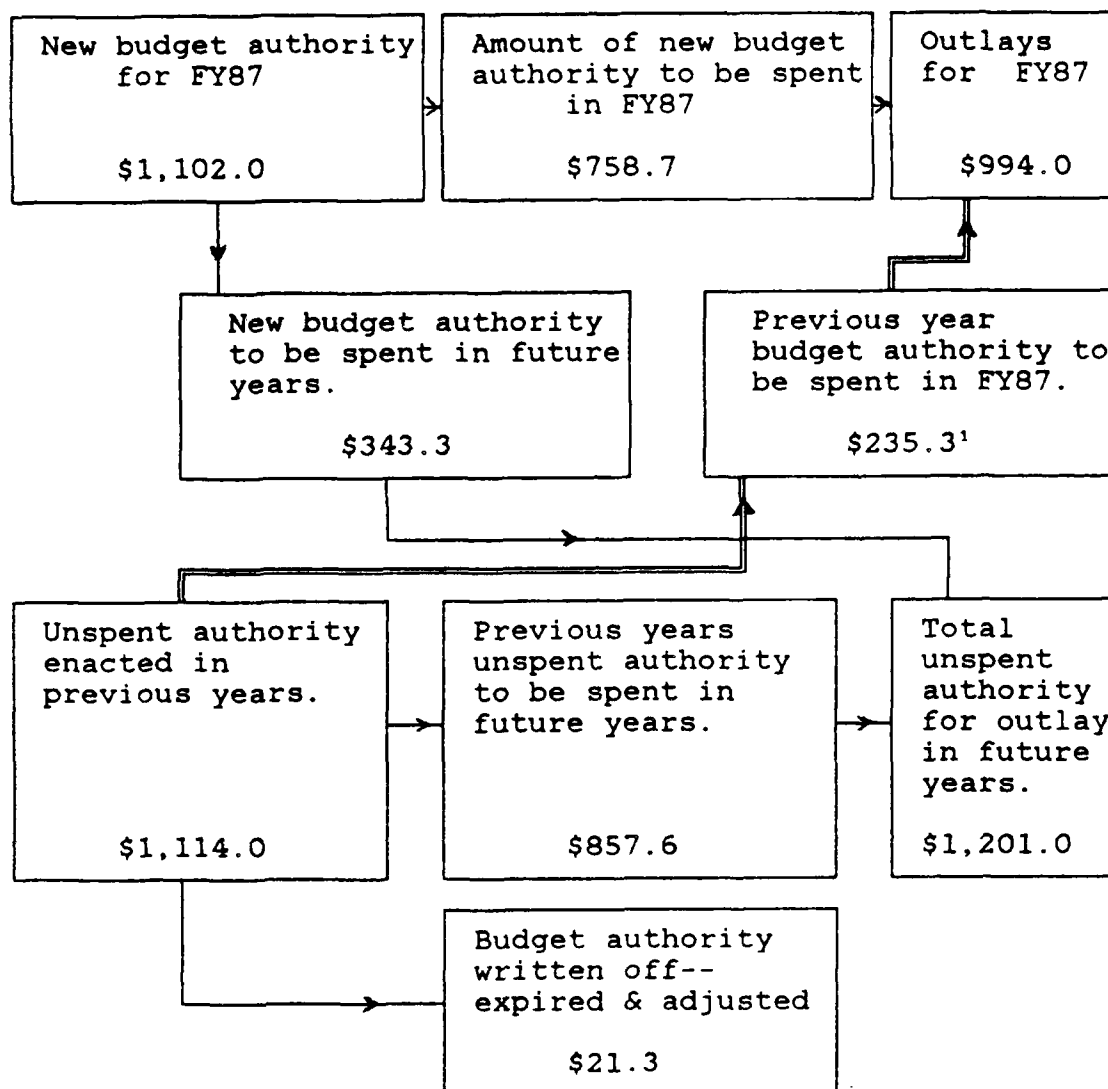
B. BUDGET TERMINOLOGY

Understanding budget terminology is crucial to knowing the implications of G-R-H. Knowledge of the following terms will provide a good basis for comprehending pertinent aspects of the budget process and G-R-H:

Budget Authority--Authority provided by law that permits government agencies to incur obligations, requiring either immediate or future payment of money. The amount authorized by the Congress to become available for obligation in a given fiscal year is called budget authority for that year. [Wildavsky 1984, p. 283]

Outlays--The actual amount of dollars spent for a particular activity. The total results from both new budget authority provided this year and unexpended balances of budget authority provided in previous years. It is the level of outlays compared to the level of revenues that determines whether the budget is in surplus or deficit. Figure 2 helps explain the relationship between outlays and budget authority. [Wildavsky 1984, p. 289]

Authorization--Basic substantive legislation enacted by the Congress that sets up a federal program or agency either indefinitely or for a specified period of time. Such legislation is a prerequisite for the subsequent enactment of budget authority and may set limits on the amount that can be appropriated. [Wildavsky 1984, p. 281]



¹Outlays from previous budget authority for DOD represents almost 40% of current year outlays vice the 24% seen in this diagram for the federal government.

Source: [Dept. of the Navy 1987, Fig. 1]

Figure 2. Federal Government Budget Relation of Budget Authority to Outlays--FY87 (billions of dollars)

Appropriation--An act of Congress that allows federal agencies to incur obligations and to make payments out of the Treasury for specified purposes. This is the most common form of budget authority. [Wildavsky 1984, p. 281]

Entitlement Program--Legislation that requires the payment of specified benefits to all eligible persons who seek them. Generally, these programs are permanently authorized and are not subject to annual appropriations. Examples are Social Security, Medicare, and Veterans' pensions. These programs and qualifications for entitlement can only be changed by a separate authorizing bill. [Congressional Quarterly 1988B, p. 336]

Mandatory spending--Outlays for entitlement programs. [Congressional Quarterly 1988B, p. 336]

Discretionary spending--Funds appropriated by Congress each year. [Congressional Quarterly 1988B, p. 336]

Revenues--Sources of money for the federal government. This includes taxes, user fees, and sales of federal assets. Sale of assets does not count as an increase in revenue for G-R-H, therefore, is not considered a deficit reducing measure. [Congressional Quarterly 1988B, p. 336]

Debt--The cumulative total of the government's annual deficit. Interest on the debt is now the third largest expense in the federal budget totalling \$151.8 billion in 1988. The national debt has nearly tripled since FY80 growing from \$914.3 billion to a projected \$2.825 trillion in FY89. [Rapp 1988 no. 8, p. 327]

Sequestration--Automatic triggering of procedures to cancel budget authority if the "projected deficit" exceeds the G-R-H target required by law. A \$10 billion buffer above the targets provides a cushion before OMB implements automatic and across the board percentage spending cuts. [Congressional Quarterly 1988B, p. 336]

Continuing resolution--Legislation enacted by the Congress to provide budget authority for specific ongoing activities in cases where the regular fiscal year appropriation for such activities has not been enacted by the beginning of the fiscal year. The continuing resolution usually specifies a maximum rate at which the agency may incur obligations, based on the rate of the prior year, the President's budget request, or an appropriation bill passes by either or both Houses of Congress. [Wildavsky 1984, p. 284]

National defense (50) account & Defense (51) account-- There is frequent confusion between these two accounts. Congress deals only with the (50) account in their annual resolutions. This account includes the traditional military defense account (51) plus defense functions that are carried out in other federal agencies, such as atomic energy, civil defense, stockpiling of strategic materials, and the selective service system. These functions comprise about \$8 billion of the National Defense budget. The Defense account (51) is what is traditionally defined as defense--operation & maintenance, procurement, military personnel, research & development, military construction and several small miscellaneous categories. The National Defense (50) account will exceed the Defense (51) account by approximately \$8 billion. [Kaufman 1986, p. 6]

C. G-R-H AND THE BUDGET PROCESS

Whether Congress will adhere to the rules imposed by the recent G-R-H legislation is debatable; however, they have certainly laid the groundwork for steps toward deficit reduction. Since raising taxes is an unpopular political initiative, efforts to reduce the deficit have centered on control and reduction of outlays via budget authority. As previously mentioned, G-R-H requires the Department of Defense to assume responsibility for 50% of the outlay reductions required if the projected deficit exceeds the G-R-H target by more than \$10 billion for FY88-FY92. There is no buffer for FY93; therefore, legislation requires a balanced budget in that year.

The deficit targets set by the G-R-H are shown in Table 2. These amounts do not include the buffer of \$10 billion. There also is a clause in the law that limits the amount of outlay reductions (sequestration) required to \$23 billion in FY88 and to \$36 billion in FY89 regardless of forecasted

TABLE 2
G-R-H DEFICIT TARGETS
(billions of dollars)

FY88	\$144
FY89	\$136
FY90	\$100
FY91	\$ 64
FY92	\$ 28
FY93	\$ 0

Source: [Congress 1987A]

deficit. This ostensibly avoids the problem Senator Chiles discussed earlier--having impossible targets because of a gross miscalculation in projecting the deficit. This measure gives a goal for FY88 and FY89 even if deficit projections are high relative to GRH targets.

Congressional compliance with the rules of the budget process has generally been regarded as poor throughout the 1980s. Congress has ignored budget deadlines, let the authorization and appropriation process get out of balance, and resorted to continuing resolutions to keep the government funded. This lack of organization in budgeting has resulted in hastily approved appropriations several months into the new fiscal year, programs authorized but not funded, programs with approved appropriations but never

authorized, and a budget with a large deficit. Secretary Robert Conn, Undersecretary of the Navy for Finance and Comptroller, has expressed strong feelings that the lack of focus and agreement within Congress is due to the change in the source of funding for elections from the party to the individual. This has caused an increase in pork barrel politics and diminishing focus on national priorities [Conn 1988].

Public pressure for responsible fiscal management in Congress created a demand for G-R-H. This legislation had teeth in the form of sequestration which would pressure both Congress and the President to take immediate action. "The automatic sequester provision is the nuclear deterrent in the budget process." [U.S. Congress 1987C, p. 3]

Since the revised G-R-H was enacted 29 September 1987 and the first year of deficit targets was FY88, Congress was immediately confronted with major budget decisions. Congress needed to pass a reconciliation bill that met G-R-H targets by 20 October 1987¹ or sequestration of \$23 billion would be ordered to become effective 20 November. Congress failed to meet the 20 October deadline, which triggered automatic sequestration procedures. Congress now had one month to propose an alternative deficit reduction plan or OMB would institute across-the-board spending cuts in

¹These were special dates established for the first year of G-R-H implementation.

eligible programs. The inability of Congress to meet self-imposed deadlines, and the threat of sequestration may have contributed to the readjustment of financial markets and international stock exchanges in October 1987 [Rapp 1988 no. 13, p. 767].

It may be argued that sequestration is not the most prudent alternative for financial management of federal funds, but it is an effective tool for prodding Congress to take action on an important problem--the deficit. In November 1987, the President and Congress took the necessary action to void the sequestration order for \$23 billion. However, it is important to understand the extent of the consequences had sequestration occurred.

Because of numerous exempted programs, one-third of the federal budget would have to absorb the full \$23 billion cut. As mentioned previously, DOD would have been responsible for 50% or in this case, \$11.5 billion of the reductions in outlays. President Reagan exempted military personnel appropriations from sequestration, thereby forcing other defense accounts to absorb increased reductions. Since Congress had not approved a budget, the baseline for computing reductions would have been based on the budget submitted by the President to Congress. To yield \$11.5 billion in outlay reductions, a higher amount would have to have been deducted from budget authority. For the DOD O&M account, the plan called for a \$11.0 billion budget

authority reduction to reach \$8 billion of DOD's \$11.5 billion reduction in outlays [Congressional Quarterly 1987F, p. 2433]. The mathematics supporting this phenomenon are explained later in this chapter.

House Budget Chairman William H. Gray III stated that, "It was important to send a message to the American people--and to the marketplace--that Congress, or at least the House, was going to act differently on the budget this year." [Rapp 1988 no. 13, p. 767] On 14 November 1987, leaders of Congress and the administration reached a "Summit" agreement concerning the budgets for FY88 and FY89. This legislation, formally called the Leadership Amendment to S. 1920, The Omnibus Budget Reconciliation Act of 1987 became Public Law 100-203 on 22 December 1987. The summit agreement achieved the goals necessary to forestall G-R-H sequestration that had been ordered by detailing a deficit reduction plan of \$25.6 billion for FY88 and \$42 billion for FY89 [U.S. Congress 1987E, p. 2]. Table 3 shows the spending caps for National Defense in FY88 and FY89 that were agreed upon as part of the summit deficit reduction plan.

The Summit called for a decrease in defense outlays of \$5 billion for FY88, which required a budget authority cutback of \$13 billion. O&M lost 6.6% from its previously requested level of increase in that reduction [Towell 1988 no. 2, p. 55]. To meet the FY89 ceiling, Secretary of

TABLE 3

NATIONAL DEFENSE (050) CEILINGS--FY88 & FY89
(billions of dollars)

	FY88	FY89
Budget Authority	292.0	299.5
Outlays	285.4	294.0

Source: [U.S. Congress 1987E: Errata]

Defense Carlucci ordered planners to reduce \$33 billion in budget authority from Secretary Weinberger's previously submitted budget to meet an outlay reduction of \$8.2 billion agreed to in the Summit.

The Summit agreement provided boundaries to a rather volatile budget situation. Having spending caps established for major appropriations through FY89 enabled longer-term planning and also provided a framework within which to make decisions.

Theoretically, all budget resolutions, authorizations and appropriations should be passed by Congress prior to OMB's forecast of the deficit each August.

Under Gramm-Rudman, as revised in 1987, the Office of Management and Budget (OMB), determines whether the estimated budget deficit will meet a target set in the law and, if not, what percentage spending cuts (sequester) will be needed. The Congressional Budget Office (CBO) plays an advisory role.

If cuts are needed in fiscal 1989, they will be imposed in a preliminary order Aug. 25, 1988 and become permanent October 15, if no alternative is enacted by that time.

The Gramm-Rudman target for fiscal 1989 is \$136 billion with a \$10 billion margin of error. As a result automatic spending cuts will be triggered if the OMB deficit exceeds \$146 billion. For fiscal 1989, the law also provides that such cuts will not exceed \$36 billion. [Congressional Quarterly 1988B, p. 336]

Both OMB and CBO publish economic forecasts. Because of the difficulty in estimating the nominal Gross National Product (GNP) and numerous other factors, the amount of revenues to be received in future fiscal years is frequently a point of disagreement between Congress and the President. This fact, in combination with different interest rate expectations, has often caused wide variation in the 1980s between the forecast of OMB and CBO. Since Gramm-Rudman sequestrations are based on forecasted economic conditions by OMB and CBO, a political scenario develops as to which prediction Congress chooses to use.

...if Congress were to use its own projections prepared by the CBO, it would have to cut much more deeply into spending, raise more taxes, or both, to meet the target--a political near-impossibility in this election year. [Cranford 1988 no. 8, p. 337]

Table 4 on the next page shows the difference in FY87 to FY89 projections for OMB and the CBO.

The difference between revenue and outlay predictions is because of different assumptions made by OMB and CBO in economic forecasting. Small percentage differences amount to billions of dollars. Economic growth is a factor in determining revenues from taxes and interest rate determines outlays required to borrow money. The following comparison explains the prediction differences in Table 4:

TABLE 4
DEFICIT PROJECTIONS FOR OMB AND CBO
(billions of dollars)

	FY87 ¹	FY88	FY89
Administration Estimate (OMB)			
Outlays	\$1,004.6	\$1,056.4	\$1,107.3
Revenues	854.1	908.9	964.7
Deficit	-150.4	-147.5	-142.7
G-R-H Target	N/A	-144.0	-136.0
Difference ²	-	(3.5)	(6.7)
Congressional Budget Office Estimate (CBO)			
Outlays	\$1,004.6	\$1,054.6	\$1,129.0
Revenues	854.1	897.3	953.0
Deficit	-150.4	-157.3	-176.0 ³
G-R-H Target	N/A	-144.0	-136.0
Difference	-	(13.3)	(30.0)

¹Actual figures used therefore both OMB and CBO agree.

²Does not reflect buffer of \$10 billion. Same for the CBO differences.

³Revised on 5 March 1988 to -\$165 billion.

Source: Cranford 1988 no. 8, p. 337]

The Council of Economic Advisors forecast for 1988 is for modest inflation-adjusted economic growth (2.4 percent fourth quarter to fourth quarter), inflation about at last year's [1987] level, lower unemployment than last year and interest rates marginally below those of last year. For 1989, the Council projects stronger growth (3.5 percent)

and continued declines in unemployment, inflation and interest rates. [Council of Economic Advisors represent the predictions of the President and OMB]

CBO disagrees, forecasting growth of 1.8 percent in 1988 and 2.6 percent in 1989, similar inflation rates, unemployment unchanged from 1987 and higher interest rates. [Cranford 1988 no. 8, p. 338]

The forecasting of a deficit will play a major role in the implementation of G-R-H and sequestration. The acting director of the CBO, Mr. James Blum, objected to the opinion that using OMB forecasts would help Congress in their battle with deficit control in 1988 (FY89). He said that, "Sooner or later reality would catch up and that would make the fiscal 1990 budget targets that much harder to reach." [Cranford 1988 no. 8, p. 338] "On the average since 1980, congressional budgets have underestimated the deficit by more than \$42 billion a year." [Cranford 1988 no. 8, p. 337] This comment causes observers to wonder whether G-R-H is merely an exercise in budgetary symbolism.

D. MONEY MANAGEMENT UNDER G-R-H

As mentioned previously, reducing outlays or the money actually going out of the Treasury is the goal of the G-R-H legislation. Controlling outlays and deciding where to make cuts is a tremendously difficult task for some of the following reasons: (1) the annual spend-out rates for the various appropriations are different and are not certain [U.S. Congress 1987D, p. 77]; (2) many programs are exempted from sequestration or budget reductions, particularly entitlement and pension programs [Gotz 1986, p. 1]; (3)

stretch-outs of procurement programs are discouraged because the unit cost will normally increase, which dilutes the financial advantage of buying economic quantities [U.S. Congress 1987A, p. 33]; (4) the Department of Defense is restricted to a total of \$1.5 billion that it can transfer between appropriations which establishes boundaries for DOD's outlay rate [Congressional Quarterly 1988E, p. 727]; (5)² outlays resulting from a previous year's budget authority are untouchable because of cancellation fees and legal penalties [U.S. Congress 1987D, p. 78]; and (6) the cost of some programs must be absorbed by current appropriations rather than augmented by Congressional funding, such as Persian Gulf operations and a portion of annual pay raises [Congressional Quarterly 1988C, p. 769]. An understanding of these aspects and how they interact with G-R-H is important.

Annual spend-out rates for DOD appropriation accounts vary considerably and are frequently grouped as "slow money" or "fast money." Spend-out rate refers to the percentage of budget authority available that is spent in a particular fiscal year. Table 5 on the next page shows the spend-out rates for DOD's appropriation accounts.

An important point to remember is that cash outlays are the focal point for G-R-H deficit reduction targets while

²This particular point is now in question before Congress.

TABLE 5

DEFENSE OUTLAY RATES, FISCAL YEAR 1988
(percent of first-year budget authority spent)¹

Appropriation title	Year/Percentages					
	1st	2nd	3rd	4th	5th	6th
"Slow-money" investment accts.						
Procurement	15	30	27	14	6	1
Research & Development	50	38	8	1		
Military Construction	12	39	23	13	6	4
Aggregate for investment group	26	33	20	10	4	1
"Fast-money" Expense accts.						
Military Personnel	94	5				
Operation & Maintenance	74	20	3			
Family Housing	49	27	12	5	2	1
Aggregate for Expense accts.	83	13	2			

¹Percentages rounded to nearest whole number.

Source: [U.S. Congress 1987D, p. 77]

budget authority is the vehicle for controlling outlays. Making the conversion from budget authority to outlays creates some serious management problems. The spend-out rate must be 100% to save \$1 in outlays for every \$1 cut in budget authority. With an aggregate spend-out rate of 26% for the slow money, there must be \$3.85 ($\$1/0.26$) aggregate cut from budget authority to save \$1 in outlays. Accounts

such as military personnel that have a spend-out rate of 94% require a budget authority cut of \$1.06 to save \$1 in outlays.

As was shown in Figure 2, the outlays for the current year are an accumulation of the outlays resulting from new budget authority plus outlays from budget authority granted in previous years. For DOD, the authority from prior year budgets represents approximately 40 percent of the outlays for the year. As mentioned previously, these outlays have generally been considered untouchable because of cancellation fees and legal penalties [U.S. Congress 1987D, p. 78]. Joshua Epstein, a research associate for the Brookings Institute comments on this as follows:

Beyond this uncontrollable 40 percent of each year's outlays another 30 percent or so is needed simply to pay, house, and administer the defense establishment. Thus if large deficit reductions--that is, cuts in actual spending--are to be made in the current year, and the major capital projects, such as new strategic and naval programs, are protected from reductions; readiness--which has grown with the budget as a whole--is bound to suffer badly. [U.S. Congress 1987D, p. 78]

Readiness and people programs appear to be in a precarious position if significant and short-notice reductions are required in DOD. This is particularly true if sequestration is necessary and equal percentage cuts in budget authority are ordered to reduce outlays.

An example of sequestration is perhaps the best means for explaining its potential effects. The scenario presented here assumes that both procurement and operation &

maintenance have a budget of \$150 billion each and that an outlay reduction of \$1 billion is desired. First year spend-out rates of 15% for procurement and 74% for operations and maintenance taken from Table 5 means that a total of \$133.5 billion ($0.15 * \$150B + 0.74 * \$150B = \$133.5B$) will be spent in the first year. This translates into cutting \$2.25 in budget authority to achieve a \$1 reduction in outlays ($\$300 \text{ billion budget authority} / \$133.5 \text{ billion first year expenditure} = \2.25). Taking the \$1 billion in desired outlay reductions and converting that to budget authority means \$2.25 billion in budget authority would be reduced ($\$1 \text{ billion} * \2.25). If both appropriations are reduced equally in budget authority, the \$2.25 billion is divided in half, leaving approximately \$1.12 billion for each account. Using the spend-out rates of 15% for procurement and 74% for operations and maintenance means that outlays would be cut \$168 million ($0.15 * \$1.12b$) for procurement and \$832 million ($0.74 * \$1.12b$) for O&M to achieve the \$1 billion reduction. The procurement account has to be cut to compensate for the difference between the \$832M and \$168M, or \$664M in outyears, unless spending authority is restored by legislation.

Fast money accounts such as O&M and military personnel are more vulnerable in the short term than slow money accounts, such as procurement, if sequestration is enacted. Navy Undersecretary Conn, indicated in a speech at the Naval

Postgraduate School on 19 April 1988 that Congress is unlikely to let sequestration take place in an election year [Conn 1988]. The time for a decision on whether sequestration is necessary for the FY89 budget is rapidly approaching--August 1988. However, before Congress can concern themselves with the August deficit predictions for sequestration, they must reach agreement on their budget resolutions. Outlay and budget authority caps were established for both domestic and defense programs for FY88 and FY89. Because of differences in opinion as to where the available funds should be allocated "...Budget committee leaders are discussing ways around the summit agreement's limits." [Rapp 1988 no. 11, p.628] Majority Leader T.S. Foley, the chairman of the 1987 summit conference, encouraged a focus on outlays vice budget authority. He told the budget committee, "It might be necessary to raise the budget authority level." [Rapp 1988 no. 11, p. 628] This argument was countered by Republican B. Gradison, who contended that, "We've got a statute to worry about. We'd be trying to sail without a rudder if we got away from the written summit, as translated into the reconciliation legislation." [Congressional Quarterly 1988D, p. 727]

The summit puts a cap on "discretionary" funding for non-defense programs. In another attempt to circumvent G-R-H and the summit agreement, several Congressmen are trying to change the definition of revolving accounts from

"discretionary" to "mandatory" spending [Rapp 1988 no. 13, p. 768]. This would free up approximately \$3.5 billion in budget authority reserved for these accounts, thus enabling budget committees to accommodate demands in other areas and still remain within the summit cap for budget authority.

With tighter budget restrictions, Congress is telling agencies to "absorb it" rather than augmenting appropriation accounts. Congress approved additional funding to support Persian Gulf operations in FY87, but provided no augmentation for FY88. Congress passed a pay raise for defense in the FY88 budget, but did not supply full funding [Conn 1988]. The consequence of this was a projected \$285 million shortfall for the Navy personnel account [Conn 1988]. Another example is a policy assumption in a non-binding House Resolution passed on 23 March 1988 which proposed,

...a 3% pay raise for military and civilian employees, effective January 1989, with 50 percent of the cost absorbed by the agencies. The recommendation assumes that the 50 percent absorption is distributed through all accounts. [Congressional Quarterly 1988C, p. 769]

The problem with "absorb it" directives or across-the-board cuts is that:

...efficient organizations are likely to be penalized more than their poorly performing peers because they will be forced to make much tougher decisions about who, what, and how cuts will be distributed....There are few rewards for conserving resources in public management. Too often, to conserve is to be irrational. In many agencies there are substantial disincentives against saving or underspending resources....Frugality does not bring personal rewards or more resources for their programs. Instead, more often than not, they are indirectly penalized because the resources they save will likely be used to make up

deficits incurred by other less efficient and self-sacrificing units and managers...managers must be shown that saving has rewards...this will require fundamental reforms in budgeting and personnel practices. [Levine 1980, p. 309]

In March 1988, President Reagan proposed an increase to DOD's general transfer authority from \$1.5 billion to \$4 billion [Congressional Quarterly 1988E, p. 727]. This would provide the budget flexibility needed when the "absorb it" philosophy is employed in Congress. Secretary Conn said that this particular measure was dead on arrival at Congress, because of fears that more money would be transferred to fast money accounts, thereby increasing the deficit gap [Conn 1988]. The inability to transfer sufficient funding has caused shortages in both personnel and operations and maintenance accounts, both of which have had to absorb unplanned contingencies [Conn 1988]. Since this thesis uses the flight hour program as an example, it is important to observe trends in budgeting for the operations and maintenance appropriation.

E. OPERATIONS & MAINTENANCE UNDER G-R-H

On the basis of information presented thus far, one would think that O&M funds are prime for cutbacks. As a fast money account, it has a high spend-out rate, therefore enabling DOD to get substantial reductions in outlay for every \$1 cancelled in budget authority. It generally is assumed that there is also less pork barrel politics involved with O&M funds than procurement or military

construction, which would make it politically vulnerable. There is no obvious flow of funds from O&M accounts to Congressional districts. Why protect O&M in a time of budget restraint?

Joshua Epstein's testimony before the House Budget Committee on 14 September 1987 discusses the choices between O&M and hardware: [U.S. Congress 1987D, pp. 13-14]

The traditional preference of the military services in peacetime, a preference shared by the Reagan administration, has been to emphasize investment, expanding or modernizing the force (or both), and giving research and development (R&D) efforts a "head of budgetary steam" to ensure against an uncertain future. The impulse is to "get while the getting is good." "Technology," runs the argument, "is America's strength. In a crunch, people and readiness--the core of the Operations & Support (O&S) accounts--can be quickly obtained. If freeze we must, the O&S-intensive option is best."

One risk inherent in this approach is that the ability of U.S. military forces to deter aggression may weaken if tomorrow's big-ticket items are funded at the expense of today's combat effectiveness (a function of readiness, skill, sustainability, and other factors largely funded under O&S). If the world is a volatile place, then perhaps the marginal dollar should be allocated to reduce immediate risk, by emphasizing readiness. Moreover, military modernization itself has called a basic premise of the O&S-intensive school into question: it is not clear that both readiness and appropriate people can be obtained quickly in a crisis. High technology requires high skill, and high skill cannot be acquired quickly.

In a report by the Senate Armed Services Committee, concern was expressed that, "...DOD is not spending enough on the operating portion of its budget--including pay and non-pay operating costs--instead is spending too much on the remaining part of the budget that pays for investment." [U.S. Congress 1987D, p. 9] A comparison of operating funds

versus investment or procurement funds between 1980 and 1988 shows that investment increased 82% in real growth vice a 25% increase for operating funds. Another comparison shows that between 1960 and 1980, operating costs consumed 55% to 68% of DOD's budget. During the 1980's the percentage has stayed on the lower end, reflecting the DOD spending emphasis on procurement [U.S. Congress 1987D, p. 133].

Some comfort can be taken in the fact that there is a general movement at all levels of DOD and selectively in Congress to protect the readiness achievements the military has made since 1980. In DOD's budget submission for FY89, funds requested for O&M increased 2.4% in real terms over the FY88 appropriation while procurement declined 4.3% and R&D remained even.

By cutting proportionally twice as much from parts of the budget that fund hardware as from the O&M request, Secretary Carlucci accommodates the complaint that Secretary Weinberger funded new weapons at the expense of training the troops and maintaining the equipment already deployed. [Congressional Quarterly 1988A, p. 343]

While FY89 O&M funds requested show an increase, the President's budget "request" is usually modified in Congress. In FY88, DOD O&M fell in Congress from a requested amount of \$86 billion to \$80.3 billion, a 4.8% decrease in real growth from FY87 [Towell 1988 no. 2, p. 57]. The risk is increased for the Navy because the general feeling in Congress is that the Navy has been doing better than the other services. This is best reflected in a 24 February 1987 statement by the senior Republican member of

the House Armed Services Committee, Congressman Dickinson, when he said, "If anybody's living in fat city, it's been the Navy for the past few years." [Towell 1988 no. 9, p. 522]

Concerned that the forces in the field be fully trained, Secretary Carlucci,

...allowed each service to fully budget for its [FY89] recommended "operating tempos"--the number of hours per month that pilots would fly, the number of days per quarter that ships would be at sea, and the number of miles per year that tanks and other combat vehicles would be driven. [Towell 1988 no. 9, p. 523]

Flying hours per crew per month for Navy and Marine Corps has averaged close to 25 hours for every year since 1980 [U.S. Congress 1987B, p. 672]. Mission capability (MC) averages for Navy aircraft have increased from 59% in FY80 to 74% in FY86 [U.S. Congress 1987B, p. 648].

Instead of trying to do more with less, Secretary Carlucci made a decision to reduce the number of units in the field to maintain high combat readiness. This resulted in the highly publicized decision to retire 16 frigates, disband two Air Force wings and one Navy air wing, plus assorted other reductions in DOD [Towell 1988 no. 9, p. 523].

The primary difficulty with O&M funds is that when agencies are asked to absorb costs, the O&M account is a likely target. Given the presence of Gramm-Rudman, Secretary Conn said that if anything is added to the budget in Congress something also has to come out [Conn 1988]. The

budget resolution process in Congress also requires this be done. Also, if the cost of the Persian Gulf must be absorbed in the O&M account, other sectors of the military are going to sacrifice some degree of readiness. Currently, the Persian Gulf operations are running \$25 million per month [Conn 1988].

F. CONCLUSIONS

Regarding the likely effects of G-R-H, former Congressional Budget Office Chief Rudolph G. Penner summarized the feelings of those familiar with the politics of Congress, "My own gut feeling is that they'll get around Gramm-Rudman. How they bury that critter, that's what's unclear." [Cranford 1988 no. 8, p. 338]

Congress is under some pressure from constituents and the financial markets to get the finances of the government back on track. From this perspective, it will be difficult to ignore Gramm-Rudman requirements. However, as expected by many, Congress is using every available tool to keep from being backed in a corner and forced into sequestration. Some of the maneuvering includes items previously discussed such as ignoring pessimistic forecast of the economy and changing the definitions of spending categories.

The true test of Gramm-Rudman will be between August of 1988 and December 1989. Sequestration is likely to be avoided during this election year, but the size of the deficit for FY88 will be apparent before the beginning of

FY89. A change in interest rates, an important variable for a debtor nation, could change the optimistic FY89 revenue forecast as well.

The budget constraints experienced in FY88 may be only the tip of the iceberg. Regardless of whether G-R-H stays on track, most segments of the military are going to have smaller budgets and will have to make some choices about what programs they are going to continue to support. "As defense budgets continue to tighten, we need to know what our priorities must be and what programs may be beyond our ability to afford." [U.S. Congress 1987D, p. 2]

IV. FINANCIAL STRESS AND MANAGEMENT CONTROL

A. INTRODUCTION

No government can incur deficits indefinitely....The increasing gap between revenues and expenditures creates stress which in turn creates change in the policies and processes of government....Financial stress impacts most directly on the processes of budgeting and financial management. [Levine and Rubin 1980, pp. 14,17]

Gramm-Rudman-Hollings is the government policy change that has been created to deal with a federal deficit that is regarded by many as out of control. This chapter examines a variety of factors that impact the decision process for an organization subjected to financial stress and constraints, in this case imposed by deficit control legislation. A model is presented to describe the phases of recognition of financial stress and a typical organizational reaction. As mentioned earlier, most managers have minimal experience with cutback management. Criteria are not well established for "...making and implementing hard decisions about which programs will be scaled down or terminated and which clients will be asked to make sacrifices." [Levine, 1980, p. 11] This chapter provides several alternatives for the manager who is forced to make strategic decisions on how to best deal with a shortage of funds.

An aspect of management that impairs the ability of federal executives to make optimal economic choices is the difficulty of managing a non-profit organization. The

federal government is the largest non-profit organization in the country. With that distinction comes a host of characteristics that make management control a unique problem when compared to a profit oriented company. Previous theses have compared the management control of the flight hour program to a model management control system [Bozin 1981; Burton 1982; Murray 1986]. This thesis concentrates on specific characteristics of nonprofit organizations that military leaders need to understand and then relates these to flight hour management and budgeting. Literature on management control provides insight into problems unique to government organizations.

B. FINANCIAL STRESS

Terms such as financial stress, cutback management, retrenchment, efficiency, accuracy, austerity and program termination become prevalent in a period of constrained resources. The importance attached to these phrases is a function of the time period an organization can expect resources to be scarce. Jones noted that, "...prudent managers will attempt to define the seriousness of the financial crisis." [Jones 1984, p. 50] Almost any organization can endure short-term shortfalls of funding which is referred to as a financial crisis. But what are the alternatives for an organization faced with financial stress, a phrase which Jones defines as a "...state in which difficulty is experienced in balancing revenues and

expenditures over a long period of time...." [Jones 1984, p. 51]

Levine notes that:

...usual remedies proposed for dealing with fiscal stress are reductions in expenditures, economies in staffing, more accurate accounting, tighter estimates, and an effort to demonstrate efficiency and effectiveness in the use of public money. Financial authorities are urged to strengthen the basic features of public budgeting as a means to control expenditures, restore public confidence, and set public finances on a firmer footing. [Levine and Rubin 1980, p. 143]

He also said that during retrenchment the relationship between the allocator and organizations receiving funds becomes strained. Allocators will:

...(1) allocate less to various places and activities (2) lower their output expectations, and (3) try to get those to whom they allocate to operate more efficiently. [Levine and Rubin 1980, p. 9]

The organizations receiving an allocation respond by:

...(1) seeking to be allocated at least as much as they have been (2) arguing they cannot or should not lower their output expectations, but eventually doing so to avoid the frustrations of too wide a gap between goals and achievement, and (3) arguing they are operating as efficiently as they can, but simultaneously seeking to be more efficient so as to minimize the output effects of the input reductions. [Levine and Rubin 1980, p. 9]

In an article on phases of recognition and management of financial crisis in public organizations, Jones presents a model that is useful for identifying various phases of financial stress for a public organization [Jones 1984, p. 52]. The model may be used for forecasting the reaction of government and military organizations to Gramm-Rudman initiatives. If deficit reduction legislation lasts through

the mid-1990s, "long-term austerity" would best describe the government's financial horizons. This category is defined by Jones as a, "...condition where revenues and expenditures are constrained in constant dollars relative to previous patterns of growth for a period of five years or longer." [Jones 1984, p. 50] There are few situations that exactly follow the events described in model, but it is the closest representation of reality when considering the important variables in financial stress. Some of the material was intentionally deleted from the model because it pertained more to non-defense organizations in federal, state and local government. The model for recognition and management of financial crisis in public organizations is as follows: [Jones 1984, pp. 52-55]¹

Timing and degree of scarcity	Phase Events (under assumption that revenues continue to be reduced through phase 7)
6 months	1. Ignoring that a real crisis exists; moderate reduction in expenditures; crisis termed "only temporary."
to	2. Short-term across-the-board spending cuts made and attempts to increase revenue from existing sources instituted.
2nd year	3. Recognition that crisis may persist for longer period (more than one year); casting the blame for causes of the crisis; ad hoc "invisible" expenditure reductions (e.g., in capital plant maintenance).

¹Time frames in left column overlap.

Relaxed and
chronic
scarcity

1st year

to

3rd year

Chronic
to
short-term
acute
scarcity

Prolonged
acute
scarcity

3rd year

to

5th year

Prolonged
acute
scarcity to
long-term
austerity

4. Broader across-the-board expenditure reduction; salary and hiring freezes imposed; efficiency-oriented program cost studies instituted; mandated programs examined for reduction.
5. Across-the-board reductions continued, accompanied by additional reductions in specific programs; some employee layoffs occur; program and policy evaluation undertaken more seriously; "hit lists" of programs for possible termination developed based upon traditional organizational criteria; Employee training and development reduced further or eliminated.
6. Across-the-board and specific program reductions; specific programs are terminated with some functions absorbed by other units; employee morale and productivity drops; some skilled and highly valued employees seek jobs outside the organization; organization heads recognize need for better and more comparable program information.
7. Further program terminations discussed or implemented; leaders recognize need for longer-term strategic planning to integrate program and financial strategies; need for restoring some expenditures recognized (physical plant maintenance and capital investment, employee training); program priorities and decision criteria established.
8. Development and implementation of long-term program and financial planning; organization missions and objectives renegotiated; continued austerity conditions accepted.
9. Implementation of program and financial plans; reorganization of functions and responsibilities undertaken; revenues and expenditures balanced for one or two successive years. Employee productivity and

morale improved; confidence in
leadership strengthened.

Beyond 5th
year

Long-term
austerity and
financial
recovery

10. Revenues and expenditures balanced
over multi-year period; improvements
made in integration of program and
comprehensive financial planning.

Direct parallels can be drawn between this model and the Department of Defense's response to Gramm-Rudman and attempts to control the deficit. Table 6 compares the administration's budget predictions for FY88 and FY89 based on the prediction in the FY86 budget and the summit in November 1987. Projecting continued growth demonstrates both DOD's and the administration's initial resistance to accept any probability of demand for deficit reduction.

TABLE 6

DOD BUDGET PREDICTIONS FOR FY88 & FY89

	FY88	FY89
Budget Authority:		
FY86 Prediction	\$411.6	\$448.9
1988 Summit Agreement	292.0	299.5

Sources: [Kaufman 1986, p.3; U.S. Congress 1987E:
Errata]

The 1984 legislation and sequestration Gramm-Rudman implementation in early 1986 was a short-lived attempt to

gain control of the deficit. The Supreme Court ruling that overturned this law gave most politicians in Washington a feeling of relief and an opportunity to avoid the deficit problem. As noted by Jones, the

...retrenchment game is not particularly attractive to politicians no longer able to reward constituents, to public managers trying to preserve their programs and jobs, or to citizens benefitting from the services of government. [Jones 1984, p. 49]

The tendency for politicians is to "...avoid thinking about retrenchment because outcomes are likely to displease great numbers of citizens and political actors." [Jones 1984, p. 49]

While Congress was debating proposals for an enactment of the Gramm-Rudman Deficit Control Act, DOD was starting to make cuts in support areas that would not be immediately noticeable. In testimony before the Senate Armed Services Committee during March 1987, Secretary Weinberger was asked by Senator Kennedy to explain a 37% reduction in requests for spare parts. Senator Kennedy was concerned that "vital needs" projected for FY88 during FY86 and FY87 budget submissions were no longer valid. Secretary Weinberger's response was that DOD had "...a lot of needs and priorities that are basically equal. If there are severe reductions from Congress, a lot of very good, necessary programs are going to suffer. That is what has happened." [U.S. Congress 1987A, p. 297] According to step 3 in the model, this is

one of the first indications that fiscal stress may be more than temporary.

Approximately two years after the first Gramm-Rudman law passed, its successor became law in September 1987. Sequestration was ordered because of Congress' inaction, the stock market adjusted, and Washington assumed that the financial markets and the public were serious about deficit control. Congressional parties blame each other for the poor state of the economy with the Democrats saying that, "the country has ignored insistent warning signals beneath the economy's surface which could lead to big troubles ahead." [Cranford 1988 no. 17, p. 1066] These events support step 3 of the model and the recognition that financial stress is more than a passing event.

Secretary Carlucci requested that 18 weapons programs be killed for FY89, air wings eliminated in the Air Force and Navy, and that the number of military personnel be reduced. These are a few of the initiatives supporting the model in the one to three year time period.

Provided that Congress stays with Gramm-Rudman initiatives, the rest of the model is plausible. The government is only in the early stages of financial constraint with respect to both the timing for Gramm-Rudman implementation and the model. If the model holds true, significant program and across-the-board cuts are going to become necessary before the full cycle is completed, the budget balanced, and

public confidence restored. Although the upper echelons of the military disapprove of readiness, training and personnel program cutbacks, financial choices may dictate cuts in these areas. William Kaufmann, a research analyst for the Brookings Institute, has written that, "...the main burden of reductions will probably fall on pay and readiness." [Kaufman 1986, p. 34] As for the training, Jones contends that,

...one of the first areas of the budget reduced when revenues fall short is personnel training. In the short-term training may be postponed, but elimination of training is likely to have a serious impact on productivity, especially when new systems and equipment are purchased. Without the capability of providing guidance and incentives through training and development, employee morale suffers and potentially valuable human resources are likely to be lost to other organizations. [Jones 1984, p. 62]

At the CPWP level, the model is equally applicable. During FY86 and FY87, little impact was felt from Gramm-Rudman. Both material and aircrew readiness remained high. In FY88, however, financial constraints became more apparent. The flight hour program, which upper levels of DOD and the Navy tried to protect from budget cuts, started to feel the effects of Gramm-Rudman [Conn 1988]. CPWP squadrons flew approximately 81,000 hours in FY87. However, the initial planning figure for FY88 was 70,000 hours. At mid-year, CPWP was informed of further reductions for the remainder of FY88 [Bruner 1988]. Regardless of the intent

to maintain a flight hour program that is immune to Gramm-Rudman, avoidance of a reduction appears to be virtually impossible.

C. ACROSS-THE-BOARD VS. PROGRAM CUTS

The financial stress model in the previous section indicated the necessity of choice in cutback management between across-the-board and program cuts. The literature is mixed on which alternative to choose and under what circumstances each should be applied.

In the early stages of a financial crisis, there is general agreement that some phenomenon take place. According to Jones' model and to the "Tooth Fairy Syndrome" discussed by Levine,

...in the initial stages of contractions few people are willing to believe that the talk of cuts is for real or that the cuts will be permanent. Initial prevailing attitude in the organization will usually be optimistic, that the decline is temporary and that the cuts will be restored soon--by the tooth fairy. [Levine 1980, p. 307]

Both Jones and Levine indicate that there is often an attempt to avoid making hard decisions on program cuts [Jones 1984, p. 55]. To reduce conflict across-the-board cuts are made. Public organizations and employees prefer the sharing the pain approach where budget cuts are allocated across-the-board for operating funds and the work force is managed by attrition [Jones 1984, p. 56; Levine 1980, p. 310]. Levine concludes that while sharing the pain may be expedient, easier to justify, helps maintain morale,

appeals to the common sense ideals of justice, and builds good team spirit in the organization; it is not responsible management. Not every unit in an organization contributes equally to the goals, purposes and basic functions of the organization [Levine 1980, p. 310]. For CPWP, the choice does not involve "units," because all squadrons have the same function. The argument should center on "programs" because they all do not contribute equally to the primary missions.

As the model predicts, if an austere condition persists long enough, some program termination becomes unavoidable. Levine supports the same perception, when he says that "...some leadership will emerge to identify and rank priorities--then allocate the cuts based on the priorities." [Levine 1980, p. 310] Program termination is by far the hardest of the cutback alternatives to implement. Making economic choices among programs requires an extensive information base capable of identifying the cost of programs. This is where a focus for the organization is important. Although establishing a focus sounds easy, "...most managers in public organizations do not think in terms of a focus for the organization." [Hosmer 1982, p. 426] The programs at the core of the organization or, in other words, the ones most central to the mission of the organization are a starting point for economic analysis. While it is difficult in a military organization to

establish any cost-benefit relationship or to measure effectiveness for these programs, there is a "critical mass" level within each one. Jones describes this resource level as a minimum below which the program cannot operate and still achieve their objectives satisfactorily [Jones 1984, p. 56]. An easy case in point would be the minimum cost required to ensure that pilots achieve the number of hours required for designation prior to specific time gates. For instance, before designation as a plane commander, pilots must have 800 hours of pilot time. A more difficult, but equally important calculation would be the critical mass hours required in antisubmarine warfare, surveillance, or antisurface programs, below which the force is not able to maintain the desired level of readiness. For programs not central to the focus or mission of the organization, it is not as much a question of critical mass as it is of whether to totally eliminate the program. This is the point where knowing the cost of programs and how much could be saved to meet a specific cutback target is important.

When program termination becomes necessary, the best approach is to explain termination decisions openly [Jones 1984, p. 58]. Every program has its defenders; therefore, the mere mention of program termination requires that the decision-maker have well-defined criteria on which to defend his position. This may be based on an organization's mission, or the cost relative to the importance of the

mission, or a reorganization of focus for the organization.

As Jones noted,

...in the heat of battle that usually characterizes program termination, managers may begin to recognize that in order to defend their decisions internally and externally, there is need for more careful development of cutback criteria, priorities, and procedures. [Jones 1984, p. 59]

One decision-making process for cutbacks that Levine thinks should be avoided is described in his "participation paradox."

...a field of organizational development teaches that the best way to manage changes is to encourage the maximum amount of participation by all parties. But, a rational cutback process will require that some people and programs be asked to take greater cuts than others. By encouraging participation, management also encourages protective behavior by those most likely to be hurt the most--insolvable problem for management, therefore across-the-board cuts are made to avoid deadlocks or rancorous conflict. [Levine 1980, p. 308]

As financial resources tighten, the centralization of decision-making also can be expected to tighten. Jones notes that while the dominant form of authority structure employed in a financial crisis is centralized decision-making, the degree of control is not as important as,

...(1) smoothing the impact of cuts, (2) continuity of leadership, (3) the extent to which crisis management is politicized, (4) ability to define organizational mission and goals, and (5) extent to which priorities are established and budgeted. [Jones 1984, p. 60]

Levine and Rubin contended that "declines in revenue tended to accelerate the centralization of executive control over...budgetary processes." [Levine, Rubin and Wolohojian 1981, p. 203]

D. MANAGEMENT CONTROL OF NONPROFIT ORGANIZATIONS

Since a nonprofit organization lacks the semiautomatic control that is provided by the profit mechanism, it needs a good management control system even more than business does. [Anthony and Young 1984, p. 57]

The federal government is the largest nonprofit organization in the country [Anthony and Young 1984, p. 37]. Management control in a military organization is different than in a profit oriented company for a number of reasons, the most important of which are discussed in this section of the chapter.

There are various definitions of management control, but the one Anthony, Dearden and Bedford use is "...the system used to do such things as collect and analyze information, evaluate it, and use it and other devices to control activities." [Anthony, Dearden and Bedford 1984, p. 5] Two important concepts to remember in discussing management control are that: (1) it is "...positive and aims to encourage, assist, and motivate managers and workers to implement organization strategies and to follow organization policies in the process" [Anthony, Dearden and Bedford 1984, p. 23], and (2) with few exceptions, "...management control systems are built around a financial structure." [Anthony and Young 1984, p. 13]

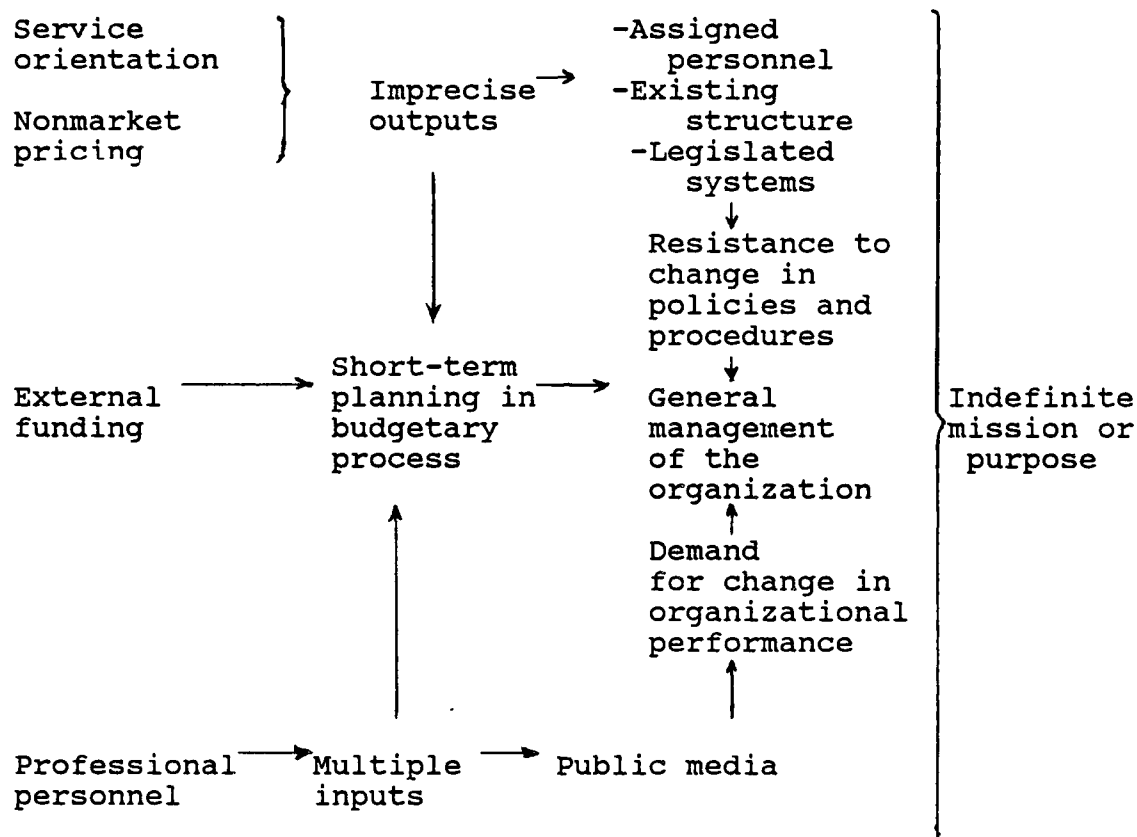
The four principal steps in a formal management control system are: (1) programming, (2) budget formulation, (3) operating & measurement, and (4) reporting & evaluation [Anthony and Young 1984, p. 10]. These steps have been

analyzed and compared to models in previous theses [Bozin 1981; Burton 1982; Murray 1986]. The purpose in this thesis is to look at some of these functions in terms of a nonprofit organization.

There are several types of nonprofit organizations. A client supported nonprofit organization receives revenues from clients and the goal is to increase the size of the organization by increasing the clientele--an example would be a port authority or airport. On the other side is the public supported nonprofit organization which involves most federal agencies, including the military. They depend entirely on a fixed appropriation process for financial resources. In this case, a new client or responsibility represents a burden on the fixed resources; therefore, a negative attitude often develops toward increased responsibilities or clients. This is a reason for complaints about poor service and the sometimes surly attitude of bureaucrats--very few "thank yous" and "pleases" if the client does not represent a potential benefit [Anthony and Young 1984, p. 14].

A listing of the characteristics and a model of a nonprofit organization will provide a basis for discussing the aspects that make management control a difficult proposition. The nine characteristics that distinguish a nonprofit organization are: [Anthony and Young 1984, p. 38]

1. Absence of a profit measure
2. Tendency to be service organizations
3. Constraints on goals and strategies
4. Less dependence on clients for \$ support
5. The dominance of professionals
6. Differences in governance
7. Difference in top management
8. Importance of political influences
9. Tradition of inadequate management controls



Source: Adapted from [Hosmer 1982, p. 422]

Figure 3. Model of Nonprofit Organization

The list of characteristics and the model define some relationships that are unique to nonprofit organizations.

The most highly publicized difference between a business and a public supported nonprofit organization is the lack of a profit motive. Anthony and Young say that:

The absence of a single, satisfactory, overall measure of performance that is comparable to the profit measure is the most serious problem inhibiting the development of effective management control systems in nonprofit organizations....In most situations, the ideal financial performance is a break-even one. [Anthony and Young 1984, p. 39]

Competition for clients in a free market encourages the most efficient use of resources or the firm will not survive.

If a competitive industry permits its cost to get out of control, its product line to become out of fashion, or its quality to decrease, its profits will decline. A public supported organization has no such automatic danger signal. [Anthony, Dearden and Bedford 1984, p. 13]

As mentioned previously, "...as a substitute for the market mechanism for allocating resources, managers compete with one another for available resources." [Anthony and Young 1984, p. 15] Program costs are easily determined, but it is hard to relate the cost to the output in determining a cost-benefit relationship or the optimum allocation of resources. In an aviation squadron, it is particularly difficult to emphasize minimizing cost for flights because of safety, an overriding factor in any cost control or efficiency programs. This is particularly true for pilots without much experience, because efficiency programs can become competitive between pilots and reduce safety margins to unacceptable levels. Over-emphasis on saving a little on

aircraft fuel by being more efficient could result in the loss of an airplane and its crew. In a squadron there are definite boundaries to reducing cost. Efficiency in the flight hour program centers more around planning for flights so that maximum training is achieved for the resources expended.

The success of a corporation is measured by management's ability to maximize stockholder wealth, which means maximizing the price of the common stock through improved earnings [Brigham and Gapenski 1988, p. 11]. The success of a nonprofit organization is generally supposed to be measured by how well they provide a service. A measure of performance for services is much more difficult than profit. In fact, to quantify and measure the output and success of a public supported nonprofit organization is almost impossible. Hosmer supported that statement when he noted it is

...difficult to evaluate the performance of organizations that are providing intangible services to diverse clients at prices that have a very limited relationship to the needs of the market or to the costs of the process. [Hosmer 1982, p. 430]

How successfully a patrol squadron is managed is not dependent on the ratio of hours of contact time on enemy submarines to the total number of hours flown. There is no cost-benefit relationship in tracking submarines.

Because of a lack of objective measures, it is common to turn to subjective opinions, and to compare prestige, not the performance, of organizations providing equivalent services to similar constituencies by parallel methods.

Opinions on this relative standing may be both subjective and biased. The evaluator has a point of view that is either consciously or unconsciously oriented by professional associations, social values, or personal ambitions. [Hosmer 1982, p. 9]

Although there have been multiple attempts to quantify the performance of patrol squadrons, awarding of the Battle "E" for excellence continues to be partially subject to factors that cannot be quantified.

As explained by Hosmer, "Control procedures are primarily oriented toward assigning responsibility for input spending since output is so variable and unmeasurable." [Hosmer 1982, p. 420] Most organizational units in government are provided lump sum grants to perform unique missions with "heterogeneous, hard-to-define and virtually impossible to measure outputs." [Jones and Thompson 1986, p. 39] This sometimes leads to a "sense that performance is not all it might be--performance can only be improved by budget augmentation." [Jones and Thompson 1986, p. 39] The flight hour program has many of these characteristics. The financial controls are on the funds allocated to a squadron and not the services expected to be received for the funds. For outputs, the squadron commander is entrusted to optimize readiness with the resources available. There is no comparison of where the funds were spent to where the PMR budget formulation process indicates the funds should have been spent. There is no magic formula or standard of comparison for resource allocation to the various missions.

Readiness is the only visible output measure of performance and it is this variable that somewhat enables the decentralization of decision-making concerning the proper utilization of financial resources.

Readiness is the one variable that comes closest to a profit measure. The measurement of readiness is considerably more subjective than profit, but it is the best overall performance indicator available to a squadron. The following dialogue supports that statement:

The best manager is not the one who generates the most sales volume, or the one who uses labor most efficiently, or the one who uses material most efficiently, or the one who has the best control of overhead, or the one who makes the best use of capital. Rather, the best manager is the one who does best on all these activities combined, therefore, profit is the measure to use. [Anthony, Dearden and Bedford 1984, p. 748]

There are direct parallels in a squadron for each of these categories and effective flight hour utilization is only one of the inputs. This is why it is difficult to draw a direct relationship between flight hours and readiness.

It is important to differentiate between efficient and effective use of resources, two criteria that are normally used in the measurement of performance.

Efficient managers are those who do whatever they do with the least consumption of resources, but if what they do is an inadequate contribution to the accomplishment of the organization's goals, they are ineffective. [Anthony and Young 1984, p. 20]

"Measures of effectiveness are difficult to come by because objectives and outputs are difficult to quantify, therefore, effectiveness, is often expressed in non-quantitative,

judgmental terms," such as Squadron "A" is doing a first rate job or Squadron "B" has slipped somewhat in recent months. [Anthony and Young 1984, p. 18] From a traditional-technical rational standpoint, quantitative is favored over qualitative measurement [Euske 1988, p. 7]. However, in squadrons, measurement of effectiveness and efficiency often depend on expert judgement and qualitative assessments because of the difficulty in quantitatively measuring outputs.

Because all 12 squadrons have the same missions, it is possible to quantitatively compare some aspects of their performance. Anthony and Young state that:

If the same program structure is to be used by a number of similar organizations, then great care needs to be taken to assure that the structure will provide comparable data so that averages and other measures can be compiled and individual organizations can compare their own data with these averages. [Anthony and Young 1984, p. 242]

This is used in patrol squadrons to some extent, particularly in maintenance. The same principle is applicable to the amount of resources dedicated annually to various programs or missions. Because of differences in the missions of various deployment sites, the resources dedicated to operational programs cannot be compared. The training programs; however, should all be similar, so there are perhaps advantages to collecting that data for comparison.

Another aspect concerning nonprofit organizations that deserves discussion is the predominance of professional personnel. In a corporation, the executives seldom have any of the same responsibilities as the newest individual in the organization. For the corporations, management is a full-time job. [Anthony and Young 1984, p. 47] That is not true in a nonprofit organization. The commanding officer of a squadron always has responsibilities as an aviation officer on an aircrew just like the youngest aircrewman in the squadron. "In a professional organization, the professional qualifications of the people are of primary importance." [Anthony and Young 1984, p. 17] The professional responsibilities are an important part of the career of every naval officer and frequently detract from the ability to become a top-notch executive in the managerial sense. The military officer is stuck in the middle between professional and managerial responsibilities--a part-time professional and a part-time manager [Hosmer 1982, p. 419].

There are several reasons for the emphasis on professional responsibilities at all levels of the organization.

In a professional organization, promotion is geared to the criteria established by the profession rather than the organization and thus may not place emphasis on efficiency and effectiveness. These criteria do not always reflect the individual's worth to the organization. Professionals tend to need a longer time to prove their worth than managers in profit oriented companies. [Anthony and Young 1984, p. 47]

This again relates to the difficulty of judging performance in an organization where measurement of outputs is

difficult. An aviator in a patrol squadron must excel in his aviation responsibilities and demonstrate superior leadership ability as a prerequisite to assignment in desirable managerial positions in the military. The talents of a sharp manager may never have the opportunity to develop if there is any problem with professional qualifications.

The characteristics of nonprofit organizations and management control systems described in this section are applicable to all military organizations. They were researched because it is important for leaders in military organizations to be aware of the differences in managing a profit and nonprofit organization. Most of the executives in the military have always worked in a public supported nonprofit organization where the funding battle is won or lost in the appropriation process. Once the appropriation is determined, annual revenues are established and military leaders must use the available resources to their best advantage. The market mechanism that establishes a balance between supply and demand and the economic laws that govern the success or failure of a profit oriented company generally are not an important variable for managers in the military.

E. SUMMARY

This chapter examined topics important for military managers confronted with extended funding restraints. Hard decisions are going to be made concerning programs and

budgets if G-R-H is implemented as designed. The uncertain nature of the federal budget process combined with deficit reduction initiatives creates risk for fast money accounts, such as O&M. The uncertainty of budget prospects for defense, the threat of sequestration, and the quarterly funding cycle for O&M could mean financial stress in military organizations for several years. Organizations can prepare themselves for such a period by developing better criteria for budgetary decision-making. Because of budgetary politics, the time schedule of G-R-H, and the difficulty of forecasting deficits, the budget is subject to major changes in a short period. This combination of events provides little opportunity for long-term planning and can create almost perpetual chaos.

The important point is that during the initial stages of cutback management, leaders can establish a focus and long-term strategy for the organization. "A clear statement of strategy of a nonprofit organization is needed both for external information and internal motivation." [Hosmer 1982, p. 423] "Strategic design involves a long-term concept of service and if properly done, provides a rationale for the continued existence and further support." [Hosmer 1982, p. 423] Hosmer notes that:

Future opportunities and risks plus current strengths and weaknesses serve as boundaries for selecting proper strategy. Within these boundaries there exist a range of strategic alternatives. The identification of alternatives is a creative task that requires imagination, innovation and perception. These characteristics,

unfortunately, are often missing at both business and nonprofit institutions; too many nonprofit organizations accept existing strategies. [Hosmer 1982, p. 431]

Developing a long-term strategy requires economic choices concerning program priorities in a cutback environment. The literature on this topic concludes that the best long-term alternative is to mix program reductions with terminations and across-the-board cuts. The choices depend on the timing and degree of cuts necessary. All programs need to be carefully reviewed to determine their contribution to the primary mission of the organization. Programs on the fringe of the organization's responsibilities need to be costed-out to determine the resultant savings if elimination is necessary. Programs at the core of the organization need to be retained at a critical mass level. Jones notes that at the point where tough decisions have to be made, "...organizations typically become aware of how much they are in need of good program activity and outcome information organized in a way that enables actual program cost and benefit comparison." [Jones 1984, p. 59] He goes on to note that:

...critical at this time is the design and execution of a planning process that generates accurate and reliable information to enable internal comparisons between programs in addition to comparisons with other organizations. Program data collected in a format that is applicable to the varied components of the organization and that permits accurate and valid response is needed. Managers are generally frustrated to learn the extent to which they have underinvested in or simply squandered valuable planning, program evaluation, information management and other analytical resources in the past. [Jones 1984, p. 59]

V. ACCOUNTING AND INFORMATION SYSTEMS

A. INTRODUCTION

...major improvements in the government's financial management systems are needed if decision makers are to have timely and reliable information as a basis for the policy choices they must make if they are to avoid sequestration. [U.S. General Accounting Office 1987A, p. 2]

This statement from GAO on deficit control pertains to financial management on an agency level, such as the Department of Defense or the Department of the Navy. This chapter deals with a lower level of organizational decision-making, but the statement appears to be germane. This chapter focuses on the decision support and accounting system required by the Commander, Patrol Wings Pacific (CPWP) in an era of Gramm-Rudman-Hollings (G-R-H) budget restraint. CPWP is the decision-maker for allocation of flight hour funding and should have an accounting and management information system to support economic choices. As mentioned in Chapter I, the formal flight hour accounting system used by the Fleet Accounting and Disbursing Center, Pacific is not in the scope of this thesis.

This chapter examines some of the factors that should be considered in improving the capabilities of the financial and management information systems that support decision-making. The problems generally experienced in implementing a new control system are also addressed. It is beyond the

scope of this thesis to develop specific requirements for the management information system (MIS) discussed in this chapter. At the time of research for this thesis, CPWP had received a contractor proposal to develop a system to standardize data collection and provide the information needed to better manage the flight hour program. Funding for such a project may not be possible in a period of budget constraints. Levine notes that this sort of problem is not unusual for organizations:

When slack resources abound, money for the development of management planning, control, information systems, and the conduct of policy analysis is plentiful even though these systems are relatively irrelevant to decision-making. Under conditions of abundance; habit, intuition, snap judgments, and other forms of informal analysis will suffice for most decisions because the costs of making mistakes can be easily absorbed without threatening the organization's survival.

In times of austerity, however, when these control and analytic tools are needed to help minimize the risk of making mistakes, the money for their development and implementation is unavailable. [Levine 1980, p. 15]

CPWP has historically collected the number of hours expended on various programs and has assembled a data base. To determine program cost, the annual funded cost per hour for all programs is applied to the hours flown for a particular category. This chapter analyzes the data from P-3C flights to determine if the variance in cost per hour between programs is significantly different from the average that is used. This information helps in not only determining the cost of programs more accurately, but would help manage the flight hour program on a squadron level,

particularly if program funding was reduced while mission requirements were maintained at a constant level or increased.

Another area requiring discussion is the problem many organizations experience in establishing management information systems. In the computer age, it is easy to collect data, but deciding what data is needed is frequently a difficult assessment. A GAO report entitled, "Managing the Cost of Government: Building an Effective Management Structure," summarizes the quality of information collected by noting in the opening paragraph that, "Today's financial reports provide a flood of information. All too often, the financial data in those reports are inconsistent, incomplete, unreliable, and untimely." [U.S. General Accounting Office 1985B, p. 1]

Studies of managers and the relationship between information systems and decision-making provide interesting insights into this problem. The conclusions of research in these areas are important for public managers entrusted with decisions on the allocation of resources. The last part of this chapter reviews this research because a demand for better decisions and more information is frequently a by-product of prolonged financial stress.

B. ACCOUNTING AND PROGRAM STRUCTURE

The choices among some major alternative programs, as well as final determination of their levels, are almost inevitably incidental to the budgeting process and require

costing prior to choice. Moreover, the generation of reliable cost data in the form needed for quantitative economic analysis requires that accounts be kept in a form that permits their ready consolidation into meaningful end-product program categories. Broad classification of expenditures by account titles gives little help either in choosing program levels or in seeking efficiency within programs. [Hitch and McKean 1986, pp. 234, 254]

Concern appears to be widespread that current financial reporting systems are not providing the information needed for effective decision-making. The President's FY88 report on the management of the United States concluded that "...financial management information is inadequate for general management purposes with large gaps in information on cash flows, program and administrative costs, property and outstanding debt." [U.S. General Accounting Office 1987B, p. 35] A GAO report further stated that:

Controlling the cost of government requires knowing what government services and programs cost and why. But today's financial reports do not paint a clear picture of those costs. They focus instead on obligations (when an item is ordered) and on outlays (when a bill is paid). Both are important, but neither is a consistently reliable measure of the resources being consumed (costs) in carrying out government programs. [U.S. Government Accounting Office 1985A, p. 4]

The previous paragraph discloses only three of many reasons for accounting system revision; all three emphasize the importance of establishing a program structure. Information from the program structure is needed for the following reasons: "... (1) to facilitate decision-making about programs, (2) to provide a basis of comparison of the costs and outputs of similar programs, and (3) to collect

financial information for reporting purposes." [Anthony and Young 1984, p. 24]

The opening paragraph of this thesis explained an accounting method that focuses on end-product missions or programs vice classes of objects. Classes of objects are personnel, supplies, fuel, rent, etc. "A structure arranged by type of resources...[such as the objects mentioned above]...is not a useful program structure." [Anthony, Dearden and Bedford 1984, p. 759] The definition of program depends on what level of government is considered. A program structure may be developed for various levels in an organization the size of DOD.

At the top are a relatively few major programs. At the bottom are a great many program elements; these are the smallest units in which information is collected in program terms. In between are summaries of related program elements; program categories. [Anthony, Dearden and Bedford 1984, p. 759]

The program system envisioned by GAO involves a "roll-up" of budgeted and actual program costs with a tabulation of variances [U.S. General Accounting Office 1985B, p. 32]. Within the military hierarchy, "detailed budget and accounting transactions are coded starting with the lowest program entity where meaningful management control can be exercised." [U.S. General Accounting Office 1985B, p. 32] The information is summarized at each level in the chain of command until it reaches the top programs--thus the concept of "rolling-up" program information. GAO organizes the top programs in national defense (050) as the conventional

forces, strategic forces, supporting activities, and atomic energy defense [U.S. General Accounting Office 1985B, p. 33]. DOD's Planning, Programming and Budget System (PPBS) has 11 basic programs versus the four discussed by GAO [Practical Comptrollership Manual 1988, p. A-8]. Every program in the military is represented in a program element under one of these programs. To accommodate such a system, the organization of the coding system becomes an important variable. Under such a system, according to GAO, it would be possible to more accurately determine the total amount of resources dedicated by all military organizations to antisubmarine warfare, training, or any other program. This sort of accounting system also might enable the determination of critical mass levels for basic program elements such as cost of transportation to and from deployment locations. However, such determinations represent a significant degree of development of programmatic and accounting structures.

Although program information is collected in the flight hour program, budget execution focuses on object classes--fuel, consumables for maintaining aircraft, and depot level repairables. Budget execution of operating target (OPTAR) is reported on the monthly Budget OPTAR Report (BOR) to CNAP. GAO's concern is that "...except for fund control purposes, little management attention is paid to comparisons between budgeted and actual results and the effect variances

have on current and future budgets." [U.S. General Accounting Office 1985B, p. 13] GAO defines "fund control" as:

...managing congressionally appropriated funds (obligational authority) to ensure that (1) they are used only for authorized purposes, (2) they are economically and efficiently used, (3) obligations and disbursements do not exceed the amounts authorized and available, and (4) the obligation or disbursement of amounts authorized is not reserved or otherwise deferred without congressional knowledge and approval. [U.S. General Accounting Office 1985B, p. 40]

"The budget is normally prepared on a program basis while the accounting is generally done on an organizational and object class basis." [U.S. General Accounting Office 1985B, p. 13] Flight hour accounting in the squadron corresponds to the GAO characterization. The monthly Budget OPTAR Report (BOR) is an object class report. As mentioned previously, program performance information is collected; however, the current system does not enable comparison of planned and actual program expenditures. Anthony and Young note that,

The analysis of variances between standard cost and actual cost according to the cause of the variance is a fairly recent development although it has been in text for more than 30 years. Such an analysis provides a powerful control tool. [Anthony and Young 1984, p. 56]

Generation of variances between planned and actual expenditures plus comparisons between squadrons could provide a more realistic updating of the PMR system used in budget formulation. Variances may also serve as a useful feedback mechanism for commanding officers concerning the

allocation of resources, particularly in an era of budget restraint.

In an assessment of accounting and efficiency, Hopwood notes that,

Appeals are made to the potential offered by improved costing procedures, more specific criteria for resource allocation, improved management information systems, investigations of administrative efficiency and better audits. [Hopwood (unk), p. 172]

The word "potential" is key because this argument on efficiency in accounting notes that while standards, analyzing variances and measuring outputs are easy concepts to understand, their implementation is difficult. The following excerpt from his article is important in understanding the difficulty of developing variances and standards of efficiency:

Generality and ambiguity of notions such as efficiency and value for money must be recognized. The ideas of comparison of inputs and outputs, and financial resources with their consequences, the delineation of those inputs, outputs, resources and consequences remains both a practically and conceptually difficult endeavor. To date, accounting for efficiency and value of money have been advanced in the name of their presumed potential rather than their practical possibility or actual consequences. [Hopwood (undated), p. 176]

The use of standards and variances goes beyond establishing a program budgeting system. Anthony and Young contend that, "The task of designing a program budgeting system is difficult by itself, but the task of revising an accounting system is much more difficult--perhaps by a factor of 10 or 100." [Anthony and Young 1984, p. 434]

Enforcing changes in accounting policies designed to improve financial management has proved to be a frustrating task. In testimony before the Senate Committee on Governmental Affairs during July 1987, the Comptroller General reenforced the financial management concerns he had made clear in GAO reports published in 1985 [U.S. General Accounting Office 1987E, p. 3]. He was seeking legislation to correct financial problems because administrative action had not brought the necessary changes. He contended that:

Organizations and the people who manage them naturally resist change. Reform initiatives, whether short-lived or permanent, represent change. Therefore, it is not surprising that administrative actions to improve operations are not fully successful, particularly when agency personnel perceive that there will be new directions from succeeding managers. The existence of a legislative mandate would provide the needed assurance that an initiative's direction, and indeed its very existence, would be stable. [U.S. General Accounting Office 1987E, p. 4]

In times of financial constraint, there is going to be a persistent effort to improve the government's financial management. The Comptroller General acknowledged that

...billions of dollars are being spent on uncoordinated efforts to upgrade accounting and financial management systems, but these efforts have routinely failed to meet their objectives. I am concerned about our government's inability to effectively hold federal managers accountable for their financial activities, generally because we lack essential financial data. [U.S. General Accounting Office 1987E, p. 1]

Judging from the literature, it appears the first step in establishing a viable tool for decision-making and effective management control of flight hour funds is improvement of program costing. Establishment of variances

and standards is a follow-on accounting step that, while difficult in itself, could strengthen overall management control system usefulness. The following section examines some of the factors involved in costing of programs, using the flight hour program as an example.

C. FLIGHT HOUR ACCOUNTING

Establishing a program accounting system may be easier in aviation squadrons than most other segments of the Navy. This is because each time an aircrew prepares for a flight, there is some primary tasking for the flight which can be categorized into a program. This is not true for a surface ship which gets underway for months at a time. Determining the allocation of resources by programs in that case is more difficult.

The importance of knowing program cost has been explained. Entering an era of G-R-H where the budgeting process is going to be volatile, an organization must know what programs are important and how much they cost. Jones' model of financial stress indicates that while across-the-board cuts may suffice for the early phases of financial constraints, economic choices on programs eventually become necessary.

CPWP is currently able to estimate the costs of various programs by using the existing data base of hours and an average cost per hour. Without a method for collecting program costs on the squadron level, using an average is the

only inexpensive alternative available. However, computers are now available in all squadrons and the ability exists to develop one standardized system for collection of flight hour and program costs. Currently, squadron systems for collecting financial information vary considerably. Some existing systems record and analyze the cost of each flight while others only concern themselves with tracking the total flight costs necessary to meet the object class requirements of the Budget OPTAR Reports (BOR). Standardizing data collection in squadrons may be necessary if CPWP is to get the financial information needed for decision-making. There are several factors to consider in initiating such a system.

Aside from the often considerable technical and budgetary difficulties encountered in developing better decision support systems for economic choices, organizational problems also inhibit progress. Anthony and Young note that:

Introduction of a new system is a traumatic experience for managers and others, particularly professionals, at all levels. [Anthony and Young 1984, p. 593]

Even if operating managers understand that the system will provide better information, their worries may not be allayed. Operating managers are part of an organization hierarchy in which they have both subordinates and superiors. Operating managers may understand that the new system will provide them with better information about what their subordinates are doing, and therefore a better basis for controlling the efforts of their subordinates, and this they welcome. But by the same token, they may perceive that the new system provides better information to their superiors about what they are doing and gives superiors a better basis for controlling their efforts, and this they are not so happy about. [Anthony and Young 1984, p. 601]

Jones and Thompson acknowledged the existence of this problem when they noted that:

To avoid making sensitive cost and performance information available to the controllers, operating managers frequently appear to deny valuable information to themselves. High quality information is not developed by suppliers for fear that this information would be used by controllers to cut their budgets. [Jones and Thompson 1986, p. 43]

Implementation of initiatives designed to improve financial management information systems was the same problem the Comptroller General noted in his testimony to the Congressional committee. To improve implementation, he sought legislative action. On an administrative level where legislative action is not an alternative, Anthony and Young note that,

The driving force for a new system must come from senior management and it is unlikely that operating managers will voluntarily embrace a new system in advance of its installation, let alone be an enthusiastic advocate. [Anthony and Young 1984, p. 594]

One of the important parameters defined for a management control system in Chapter IV is that it must be "...positive and aim to encourage, assist, and motivate managers to implement organization strategies and to follow organization policies in the process." [Anthony, Dearden and Bedford 1984, p. 23] The system should be designed to improve data collection, including requirements already in existence, so that it helps management control on a squadron level as well as for higher commands. Standardization of the requirements for collecting program information provides a focus for the

organization, reduces conjecture as to what information is important or needed, and eliminates the collection of unnecessary information that previously may have been required.

Given organizational tendencies to resist change and the technical problems of implementing computerized information systems, it is important to determine whether a change is warranted. Is an average cost per hour sufficient for costing programs when decisions may have to be made on program cuts, critical mass levels, and what programs are achievable with the resources available? To help answer this question, I examined fuel usage from approximately 250 flights to determine if the standard deviation in cost per hour was significant enough to justify increased accuracy in program costing. The flight data was provided by VP-5 while deployed to Sigonella, Sicily in 1988.

The funded cost per hour varies between deployment sites because of unique "on-top" requirements, e.g., the amount of fuel required in the aircraft at the completion of a flight to enable a divert to an alternate airfield. In some cases, the nearest divert airfield is three hours flying time away. It costs money to carry extra fuel, which increases the cost per hour required to operate from some deployment sites. VP-5 was funded at \$453 per hour with fuel (JP-5) priced at \$0.66 per gallon. This equates to 686.4 gallons per hour assuming that JP-5 is the only gas used. JP-4 at \$0.61 per

gallon is also used by P-3s, but the usage is minimal and was not considered a significant variable in this problem. It is important that gallons per hour be used because cost per hour fluctuates each year with changes in government fuel contracts. Table 7 is a breakdown of the important information from the flight data. Appendix C shows a graphic distribution of the gallons per hour (GPH) versus flight time for each category.

TABLE 7
FLIGHT DATA FOR P3-C

Type Flight	No. of Flights	Average Flt. Time	Average GPH	Standard Dev. of GPH
Operational ¹	129	7.9	616.3	75.7
Surveillance	34	7.3	636.8	132.7
FAM/DFW	23	3.0	648.5	65.2
Maintenance ²	19	1.4	692.8	278.0
<u>Airways³</u>	<u>47</u>	<u>5.5</u>	<u>700.6</u>	<u>76.6</u>
Total	252	6.4	635.4	121.4

Note: Auxiliary Power Unit (APU) preflight and postflight fuel included as fuel used on the flight.

¹Includes all operational and exercise flights, except low-level surveillance.

²Includes 3 magnetic anomaly detection (MAD COMP) compensation flights.

³Includes transit to deployment.

Source: [Patrol Squadron FIVE 1988]

Several conclusions may be drawn from this data that support the need for more detailed program costing. The difference between the funded gallons per hour (686) and the flight data's average gallons per hour (635) is 51 gallons per hour. This 7.5% of the funded gallons represents the flight fuel used to perform ground evolutions such as ground maintenance using the aircraft's auxiliary power unit (APU), engine turn-ups for maintenance, and ready alert preflights. This sort of information is useful for performing a cost-benefit analysis in determining whether purchasing ground power units would be more economical than using the aircraft's APU. This 7.5% does not include aircraft fuel consumed by the APU during preflights or postflights--evolutions where ground support equipment is more efficient. Currently, the amount of flight fuel expended on ground functions is not tracked for such analysis.

Significant information obtained from the data is the standard deviation for the total sample. For example, a standard deviation of 121 gallons per hour means that 68% of the flights had fuel usage rates between 514 and 756 gallons per hour (635 ± 121). In percentage terms, this is a 19% deviation from the average gallons per hour.

The graphs in Appendix C provide the distribution of fuel usage rates. Longer duration flights have a more efficient fuel usage rate and follow a more predictable pattern. The graph in Appendix C which includes all

flights, reveals an extensive distribution in gallons per hour for those flights below 4.0 hours. Four out of the five highest consumption rates were maintenance check flights lasting less than one hour and all had usage rates exceeding 1100 gallons per hour.

Although not relevant to the variance in gallons per hour, the graph of total gallons used versus flight time provides a model for predicting fuel usage based on flight time. Since there is only one independent variable, a simple linear regression is appropriate for my analysis of the data. The computer software uses the data to generate results in the following equation form: " $Y = aX + b$ ", where " Y " is the dependent variable and represents total gallons and " X " is the independent variable, the flight time used. The constant in the equation is " b " meaningful only within the relevant range of " X "--minimum to maximum flight time of the data. The slope of the regression line is the prefix " a ," indicating the unit change in gallons per hour for each unit change in hours. The equation resulting from linear regression of the data for the 250 flights is:

$$Y = (604.27 \text{ gallons per hour} * X \text{ hours}) + 209 \text{ gallons}$$

Using the equation, a flight of nine hours can be expected to use 5,647 gallons of fuel, producing the expected value of " Y ." The actual observed value " Y_a " will probably be something slightly different than the predicted 5,647

gallons. This difference is explained by random error, deviation, or residual and is represented by an "e" in the equation for observed data:

$$Y_a = a + bX + e$$

The regression equation is a line fitted to the observed data that minimizes, more than any other line, the sum of the squared errors. [Liao 1988, p. 3]

The ability to derive an equation from a set of data does not in itself determine the accuracy of the prediction model. Statistical relationships determine the quality of the regression model. Methods for evaluating the regression are important because they describe the relationship existing between "Y" and "X." For this particular case, the analysis is relatively simple because there is only one independent variable. Regression models typically involve more than one independent or explanatory variable and the challenge is to determine the effect that each variable has on the one dependent variable. Computer software made the regression of the flight hour data simple. The key to the usefulness of the result is proper analysis of the output. [Liao 1988, p. 13]

The regression has a coefficient of determination, $R^2 = 95.5\%$ which means that 95.5 percent of the sample variation in total gallons can be explained by the change in hours [Liao 1988, p. 13]. The standard error of the estimate (S_e)

equals 419 gallons meaning 68% of the observations fall within plus or minus 419 gallons of the regression line predicted by the above equation. Ninety-five percent of the observations fall within $1.64S_e$ or 687 gallons of the predicted.

Flight hour data bases collected for various deployment sites would enable the creation of similar regression models. Such predictive models would be useful to operations personnel in managing a flight hour budget and to flight crews in determining the efficiency of their flight. There are a number of potential uses of improved costing of flight hour information, particularly if a predictive model is available by type of mission.

The primary benefit of improving the costing of flight hours is that the information derived will enable better utilization and allocation of scarce flight hour resources. Improving the efficiency with which resources are consumed is a strategy that increases in importance as resources become more constrained. Improved mission cost information can be used on several different levels in the chain of command to enhance efficiency and decision-making. Squadron pilots, the operations officer, the squadron commanding officer, and CPWP, the manager ultimately responsible for the optimum allocation of flight hour resources, all can use better information to improve performance, management control, and decision-making. Prior to discussing the

potential benefits, it should be noted that there are no financial analysts or comptrollers assigned to CPWP or any of its subordinate commands. The comptroller works on the staff of Commander Naval Air Force Pacific. Resource allocation within CPWP is determined by operators usually without the assistance of personnel trained in financial management.

There are 36 pilots in each squadron trained to fly the P-3 aircraft. Part of that training focuses on fuel management and the factors that should be considered in determining fuel requirements for each type of mission. Conservation of fuel is emphasized from the beginning of training but there are few feedback mechanisms to help a pilot determine if his practices are the most efficient. Fuel management models are available to help in planning point to point missions that are not operational, i.e., flights similar to the profile of a commercial airline company. These detailed models provide excellent feedback on whether the aircraft is being flown efficiently. For operational flights and many of the training evolutions, there is no model to provide feedback to a pilot on efficient use of resources. Although some fuel planning can be achieved using the P-3 flight operations manual, the most common methods of determining fuel requirements for various missions are "rules of thumb." These are guidelines generated through experience and training. They are a rough

estimate, cushioned on the safe side of fuel requirements, and are controlled by the pilot in command. Unlike the airlines, there is no organizational control of the amount of fuel loaded on an aircraft for a particular mission. Because cost information is not available for the different types of missions, a pilot does not have a model based on actual flights to predict requirements or to measure efficiency once the flight is completed. For squadrons that record fuel efficiency on individual flights, there is a tendency to compare those fuel usage rates to the funded rate. This is deficient from two standpoints: (1) the funded cost per hour includes an expenditure allowance for ground maintenance, and (2) the cost differs for many of the missions being flown. A monthly average of fuel usage for a pilot may be useful when compared to an overall squadron average, but there is too much time delay in feedback, an important factor in management control systems.

On a day-to-day basis, the squadron's operations officer is the manager responsible for flight hour allocations. He may not be a pilot and may be unfamiliar with consumption rates for the various missions. Information on fuel consumption may come from individual flights, but most probably comes from the squadron 10 day reports which are object class reports. The 10 day reports include fuel usage rates for the last 10 days, the month to date, quarter to date, and fiscal year to date. Quite often, average cost

for a 10 day period is considerably off from the funded amount and the quarterly average is close to the funded. A program costing model would enable better estimates of short period expenditures and provide a more useful flight hour planning tool. Frequently, there are problems at the end of the quarter trying to gauge the expenditure of the remaining resources because the funded average is only valid as a predictive model for long periods of time.

In addition to flight hour planning, the operations officer is in charge of pilot training. The availability of program costs would provide better evaluation of pilot performance. There are pilots who make an effort to conserve fuel where possible and there are others who frequently take more than required, or who do not fly the aircraft in the most efficient manner. A program costing model with reasonable variances provides the opportunity for the operations officer and pilot training officer to monitor trends in flight performance and provide feedback when required.

In the regression analysis, the gallons of fuel used per flight was directly related to the number of hours flown. The same mission or program usually requires approximately the same amount of flight time, e.g., most pilot training flights are three to five hours, maintenance check flights are usually less than one hour, operational flights are eight to ten hours, mining two to three hours, etc..

Programs of similar lengths and flight profiles could be combined to produce standards accurate enough to measure efficiency and provide the realistic planning tool needed by the operations officer. Once gallons per hour rates are known for the individual programs, they can be categorized and combined to produce functional management control tools. This would be an improvement over using the funded rate as a standard for planning, determining efficiency or measuring flight performance.

The commanding officer of a squadron generally is not concerned with the details of cost management. However, he can use improved program information in determining the optimum allocation of resources. Although squadron effectiveness in a particular program is difficult to measure, one attribute available to a commanding officer under a program structure is the ability to compare the amount of resources dedicated to particular missions with the average of all 12 squadrons. Averaging all 12 squadrons resource allocations eventually produces a useful model from which standards and variances can be determined. These standards provide a focus for the organization and help determine the level of resources that should be devoted to a particular program. Optimizing readiness and training drives the allocation of flight resources on a day-to-day basis. However, the system does not provide any indication of whether the readiness and training objectives were

achieved in the most efficient manner. The program structure created from averaging information from all squadrons may or may not be optimal, but it does establish a baseline for resource allocation that is applicable to the decision-making process in all 12 squadrons.

CPWP is the highest level in the chain of command that would benefit from increased program cost information. He is the individual who must make the difficult decisions on funding priorities in a constrained fiscal environment. He provides the focus for the organization on program priorities. Flight hours for CPWP decreased from over 80,000 in FY87 to less than 70,000 for FY88. CPWP makes the decision on how the organization will adapt to such a decrease in flight hours. Improved program costing would help CPWP in decision-making because it would provide specific information on savings for a variety of alternatives. Knowing how much of the organization's resources are devoted to each program is critical in making economic choices. There is a critical mass level for the core missions, a service quantity that cannot be cut without degrading safety and readiness objectives. This core represents the minimum acceptable funding level. Programs that are not primary or secondary missions are candidates for elimination, but knowing the resultant savings is important because it reduces the number of changes in decisions required to meet specified budget targets. These are programs that may have

evolved when resources were available to accommodate additional missions. Under fiscal constraints, the focus must be reestablished for the organization's primary missions.

The average of all squadron program flight hour allocations could provide a meaningful management control tool for CPWP. He can evaluate the overall resources squadrons are dedicating to particular programs and make adjustments in organizational focus and priorities. Increased accuracy in program costing breaks out programs that were previously "invisible" in an object class flight hour account. The amount of flight hour funds used in non-flying evolutions such as preflight inspections, postflight inspections, and maintenance could provide the information needed to justify additional ground support equipment.

Maintaining a program structure enables CPWP to update the flight hour budget formulation model--PMR. Currently, the model is supported by several assumptions on flight time required in particular evolutions to achieve a desired readiness and training level. The accumulation of actual program information will either reenforce the assumptions made in the model or provide the information needed to make changes. This process helps to justify funding requirements and identify critical mass levels required to support readiness, training, and operational objectives.

Resistance to implementation of increased costing of flight hour programs may be expected. Some managers will consider the increased costing too great an expansion in the chart of flight hour accounts. Others may resist the change because the mention of standards, variances, and measurement of performance represent another variable that must be considered in decision-making. Squadron commanders may feel that increased information will result in too much control from organizations outside the squadron that will restrict their own decision-making authority. With computers available to facilitate the collection and analysis of flight information, there is an opportunity to improve the allocation of resources and the management control of the flight hour program. Computers provide opportunity for improved accountability over the expenditure of resources. Prior to the availability of computers this task would have been too cumbersome.

One problem in tightening management controls on flight hours is the difficulty in controlling the accuracy of data collected for individual flights. Depending on the length of the flight, discrepancies of 15 to 30 minutes flying time become important in determining whether flight hour resources are used efficiently. This would affect the evaluation of pilot performance, but should not be a factor in other aspects of a program costing structure.

Collection of fuel usage for each flight appears to be needed if improved accuracy in program costing is desired. The data collection system would need transaction codes to enable information to be categorized for reports, decision support, and program costing. Ideally, "...a database should contain all data items that will be needed by any user of the system, stored in such a way that they can be retrieved." [Davis and Olson 1985 p. 524] Deriving program costs will require the development of a relatively standardized management information system for the squadrons. Several concepts discussed in this next section are important concerning development of computerized management information systems.

D. MANAGEMENT INFORMATION SYSTEMS

Everybody could use better information. No one is doing as well as he could do if only he knew better. [Anthony and Young 1984, p. 613]

The Comptroller of the United States reported to Congress in July 1987 that,

Billions of dollars are being spent on uncoordinated efforts to upgrade accounting and financial management systems, but the efforts have routinely failed to meet their objectives. [U.S. General Accounting Office, p. 1]

This statement underscores the necessity to determine organizational needs accurately prior to committing resources for systems design.

It is assumed here that a prolonged period of financial stress will create a demand for more information to justify

expenditure of resources. Determining what information to collect is a difficult problem and one that is typical in most organizations. "A common phenomenon in organizations is the accumulation and storage of data that has very little probability of being used." [Davis and Olson 1985, p. 256] Management information researchers Feldman and March concluded that accumulation of too much information is the result of:

...(1) much of the information gathered by organizations is for surveillance and not for decision-making, (2) information is often gathered and communicated to persuade and even to misrepresent, and (3) information use is a symbol of commitment to rational choice. [Davis and Olson 1985, p. 256]

This last reason is considered the most significant. Several other theories attempting to explain the tendency to overcollect data are: (1) "...the increased confidence decision-makers appear to obtain from added data" [Davis and Olson 1985, p. 256], (2) "...people attach a significant value to opportunities even though they are not used" [Davis and Olson 1985, p. 256], and (3) "...value is not in the actual use...but is a psychological value assigned by recipients to having data available." [Davis and Olson 1985, p. 256]

Alvin Toffler, the author of Future Shock, finds significant problems with society's emphasis on information and asserts that, "...our natural capacity to filter and select information is overworked; we are constantly required

to operate in 'crisis mode,' resulting in higher stress and its accompanying physical problems." [Davis and Olson 1985, p. 257] The rapid change in technology and the increased availability of computers have generated a capacity to produce enormous amounts of information. "Managers have traditionally responded to increased information capabilities by requesting more and more information...the real problem is overabundance of irrelevant information." [Davis and Olson 1985, p. 257]

There is a significant amount of information theory research that has been applied to decision-making. Several aspects of this body of theory are useful in the design of management information systems. These include, "(1) information has surprise value, (2) information reduces uncertainty, (3) redundancy is useful for error control, and (4) information only has value if it changes a decision." [Davis and Olson 1985, p. 225] An important point is that data should support decision-making or there is no need to gather it. Information should be used for proactive decision-making rather than for strictly reactive, defensive purposes. In many cases,

the actual value of the additional information is zero....On the other hand, information systems may be designed to accumulate data for later utilization in decisions; the value of the information cannot be determined at the time it is collected and stored. [Davis and Olson 1985, p. 226]

"A frequent mistake in information system design is to produce volumes of data in the form of reports because they are easy to produce." [Davis and Olson 1985, p. 226] As revealed in this review, the determination of what information to collect is not easy. This may be the root of the problem of ineffective systems addressed by the Comptroller General.

One of the most important advantages of a management information and decision support system is the ability to quickly see the results of "what if" or simulated scenarios. An organization that needs the capability of simulation computerized modeling typically has the following characteristics: "(1) complex manipulation of data, (2) several iterations required before an acceptable result is achieved, and (3) frequent need for reanalysis." [Davis and Olson 1985, p. 384] The flight hour program at CPWP meets all the above criteria. It has a high degree of uncertainty in the budget and the quarterly allocation process requires continuous analysis of alternatives. An example of the applicability of simulation would be to determine the effect of a specified reduction in flight hours on qualification time for pilots.

Development of computerized management information systems is complex and frequently requires the skills of specialists outside the organization [Davis and Olson 1985, p. 427]. Use of specialists unfamiliar with the

organization also creates problems e.g., communication of requirements may become more difficult. It is important that managers in the organization determine the requirements of the system instead of letting a contractor impose criteria that may not be useful. Tight control of the development of a management information system may be an important variable for successful implementation and usefulness.

This review of management information system concepts indicates factors that managers should be aware of in the early development of a management information and decision support system. Navy patrol squadrons presently are in the early stages of computer use. There have been relatively few users and the application has been primarily to meet basic needs, such as tracking supply requests, and maintaining crew readiness and training information. Additionally, organizational training is needed to improve utilization as management information system use expands in squadrons.

E. SUMMARY

This chapter examined justification for using a program structure in lieu of object classes as the baseline in developing a financial information and accounting decision support system. More accurate costing is needed to make decisions on a program's potential savings if elimination or reduction are anticipated. This is particularly true during

a period of financial constraints where hard program decisions are required and there is reduced room for error.

Recognizing the need for more accurate information on program cost is only part of the problem. Implementation of change is difficult because of organizational resistance to change. This particular aspect frustrated the Comptroller General so much that he sought legislation to enforce improvements in financial management of the nation's resources [U.S. General Accounting Office 1987E, p. 4]. Administrative initiatives had not achieved the desired results. Many of the improvements made in federal organizations have been only temporary because of frequent changes in leadership positions and shifts in organizational emphasis [U.S. General Accounting Office 1987E, p. 4].

The P-3 aircraft is responsible for a wide array of programs. The data presented in this chapter shows that there is significant enough variation in the cost of flying that an overall average cost per hour may not be sufficient for determining program cost and managing a complex flight hour program. G-R-H introduces significant uncertainty into the budgetary process for all defense programs. Knowing program costs and available alternatives is essential when the risk of cutbacks is high over a sustained period.

Improved program cost can be utilized to improve performance and efficiency at every level in the chain of command. There is an opportunity for feedback of flight

performance and efficiency for pilots. Accuracy in costing will improve the planning and management capabilities of operations personnel. An average of all 12 squadrons program allocations creates a standard by which individual commanding officers can evaluate their squadron's resource allocations and priorities. This particular aspect may provide a tool for increasing the efficiency with which readiness and training objectives are achieved. Variances from the norm can help determine whether too many or too few resources are dedicated to a particular mission. CPWP can use program costing information in making decisions on organizational priorities, in providing focus, and in motivating squadrons to achieve specific objectives. CPWP can also use the program information for making economic decisions when flight hour resources are cut. Knowing the cost of all programs, the critical mass for primary and secondary missions, and the priority of missions within the organization are important factors in making budget decisions. Knowledge of this information also helps to improve the flight hour budget formulation model--PMR. Collection of program information will either support assumptions made in the model or provide the information needed for changes.

Having computers in squadrons makes program costing a feasible flight hour accounting alternative. Prior to computers collecting the necessary information would have

been cumbersome and inefficient. Implementing a management information system in squadrons to collect the information necessary for cost finding is difficult and time consuming. The hardware is available in the squadrons, but there is a gap in training and utilization of the hardware. With a high turnover of squadron personnel, training becomes a never-ending process and it is difficult to sustain momentum and support for programs unless they can show direct benefit for the squadron. The demand for information on maintenance of the aircraft and the flight hour program is already substantial. If it is assumed that additional information is necessary to accurately determine program costs, this suggests that an in-depth analysis of system design and information for decision-making is required. Controls are needed to discourage the tendency in organizations to collect irrelevant information just because the data is available. If information carried a price, demand for irrelevant information would significantly decrease.

Costing of fuel to support programs is only part of the "full cost" of a program. To determine the full cost of flight hours and programs, allocations would be necessary for depreciation expense on aircraft and buildings, personnel training, pay, spare parts, maintenance on the aircraft, and overhead expenses. This would distribute object class expenditures to the end-products of the organization--aircraft missions. This type of accounting

system is similar to that of government and private organizations where all expenses are allocated to determine the full cost.

VI. CONCLUSIONS

A. GENERAL

This thesis project attempted to show that timely collection of cost information will be useful for military decision-makers confronted with the Gramm-Rudman-Hollings (G-R-H) Budget Deficit Control Act and other potential budget cuts. Chapters III, IV, and V reviewed concepts from current literature on the G-R-H Act, financial stress, management control in nonprofit organizations, program structures for decision-making, and financial management information systems.

After seven years of exceptional growth in the early 1980s, the budget of the Department of Defense began to experience the results of Congressional deficit control measures. Uncertainty dominates the future budget environment of most organizations in the military. If the revised G-R-H Act is implemented according to plan, budgets will continue to be cut and military leaders will be faced with difficult economic choices. This thesis explains why G-R-H controls are a threat to military budgets and how organizations should prepare for a period of financial constraint. The flight hour program for CPWP was used as a model for evaluating the application of concepts researched

in the thesis. Most of the thesis, however, is applicable to any military organization.

This chapter highlights the critical points discussed in the thesis, answers the questions proposed in the Chapter I and suggests topics for further research.

B. GRAMM-RUDMAN-HOLLINGS (GRH) ACT

The GRH Act is a complicated piece of budgetary legislation. While the basic idea of GRH is understood, its details and potential impact are a puzzle for many government managers. Whether GRH is ever allowed to again get to the point of sequestration will be decided by politicians under pressure from voters. There is pressure to spend money to keep the economy growing, pressure to not raise taxes, increasing pressure to balance the federal budget responsibly, and selective pressure by political action committees seeking to influence legislation. Although domestic spending increases are as responsible for the nation's debt as defense, the immediate focus of Congress seems to be to reduce defense spending below previous rates.

Spending caps for FY88 and FY89 were established during December 1987 in a special "Summit" meeting of the President and Congressional leaders from both parties [U.S. Congress 1987E, Errata]. Spending limits for outlays and budget authority were agreed on for both domestic discretionary spending and defense spending. The outcome sent a clear

signal of decreased funding for the nation's defense. The Summit detailed deficit reduction measures totalling \$25.6 billion for FY88 and \$42 billion for FY89, which with the spending caps, were included as part of "The Omnibus Budget Reconciliation Act of 1987" passed in late December 1987 [U.S. Congress 1987E, p. 2]. These measures voided the G-R-H sequestration order of \$23 billion that had taken effect in November 1987 [Calmes 1987, p. 3117]. The sequestration order required across-the-board cuts, but the Reconciliation Act targeted more specific revenue increases and budget cuts. To comply with the Summit agreement, DOD pared \$13 billion in budget authority from the FY88 budget and reduced the FY89 budget request by \$33 billion [Towell 1988 no. 2, p. 55]. These reductions represent the beginning of an effort to eliminate the nation's deficit by FY93.

The Summit spending caps have increased the difficulty of making economic choices for both domestic programs and defense, and have caused Congressional committees to look for opportunities to work around the limitations imposed by the Summit. For example, definitions of "revolving fund" accounts are being changed from discretionary to mandatory in an effort to increase the discretionary budget authority available [Congressional Quarterly 1988D, p. 727].

The G-R-H Act requires automatic sequestration if the forecasted deficit exceeds the deficit targets by more than \$10 billion [Congressional Quarterly 1988B, p. 336].

Sequestration involves equal percentage cuts in budget authority for all eligible domestic and defense programs [Congress 1987A]. DOD is required to absorb 50% of the total spending cuts [Congress 1987A]. The decision on sequestration is made at the end of August and becomes effective at the beginning of the new fiscal year unless Congress can correct the problem prior to that time [Congressional Quarterly 1988B, p. 336]. The sequestration decision is based on economic forecasts of the deficit [Cranford 1988 no. 8, p. 337]. Large forecast errors are possible with small percentage changes in the estimate of revenues, interest rates and GNP [Cranford 1988 no. 8, p. 338]. The forecasts have averaged \$42 billion below the actual deficit for the last 10 years [Cranford 1988 no. 8, p. 337]. Congress has indicated that it will use the forecast of the Office of Management and Budget (OMB) instead of the Congressional Budget Office (CBO) in August 1988 [Congressional Quarterly 1988D, p. 726]. It may be speculated that this decision is because OMB's is more favorable and reduces the likelihood of sequestration in an election year. Sequestration is limited by the Balanced Budget and Emergency Deficit Control Act of 1987 to a maximum of \$36 billion for FY89 [Congressional Quarterly 1988B, p. 336]. If the optimistic economic forecast of OMB does not meet the requirement, DOD could be in for increased budget cuts as early as FY89.

The primary objective of the deficit reduction measures is to reduce outlays--the money actually spent in a fiscal year [Congressional Quarterly 1988B, p. 336]. Appropriations are in terms of budget authority, the amount of money that can be obligated for a program [Congressional Quarterly 1988B, p. 336]. Appropriation accounts such as military pay and operations and maintenance (O&M) are annual appropriations and spend almost all of their funds in the year appropriated; i.e., they have a high spend-out rate [Kaufman 1986, p. 10]. Procurement and other investment accounts have multiple-year appropriations and spend only a portion of the program cost each year [Kaufman 1986, p. 10]. Since the objective is to reduce outlays, the fast spend-out accounts of O&M and personnel are more at risk for reduction than slow spending accounts [Kaufman 1986, p. 34].

Secretary Carlucci has cut some programs in an attempt to keep from cutting personnel and operating funds excessively, but to save \$1 in outlays requires a reduction of three to four times that amount in budget authority for procurement accounts [Congressional Quarterly 1987F, p. 244?· Towell 1988 no. 9, p. 522]. Although officials are trying to avoid cuts that impact readiness, the potential for reductions in the flight hour program is high. Decision-makers for most programs in the military must prepare themselves for difficult economic choices over the next five years.

C. FINANCIAL STRESS AND MANAGEMENT CONTROL

The G-R-H Act requires increased budgetary austerity through FY93 if the legislation is implemented according to schedule. For many government organizations, this prolonged period of constraints will create fiscal stress. Jones' model of organizational fiscal stress presented in Chapter IV is one means of appraisal of the phases that an organization can expect to go through when subjected to reduced funding [Jones 1984, p. 52].

The initial phases depicted by the model can already be supported by actions within DOD and Congress. When deficit control measures were first initiated in the 1985 G-R-H Act, DOD estimates of future budgets seemed to ignore that a crisis existed [Kaufman 1986, p. 11]. The budget predictions showed increases that were inconsistent with deficit control proposals. Testimony by DOD officials before Congressional subcommittees sought support for continued defense increases, blaming domestic spending for the deficit problem [U.S. Congress 1987A, p. 215]. Other committee testimony resulted in a decrease in support for spare parts purchases, a less visible expenditure reduction that may not have an impact for several years [U.S. Congress 1987A, p. 297]. Not until January 1988, when major program cuts were announced, did DOD appear to acknowledge that an austere fiscal environment was more than temporary.

All of these actions agree with the initial phases of recognition of financial crisis in the Jones model. One of the major points of the model and of this thesis is that hard choices have to be made between across-the-board cuts and program cuts once prolonged fiscal stress takes place. Decision-makers at all levels are likely to be confronted with difficult budgetary choices. The easiest path is across-the-board cuts, a choice that generally dominates the early phases of decision-making. The model predicts, and there is evidence to support, that an extended period of budget austerity will require program cuts [Jones 1984, p. 54; Towell 1988 no. 9, p. 522]. This is the point where military leaders must provide leadership to guide organizational response. A clear set of priorities can be established to direct the expenditure of limited financial resources. These decisions should be based on a program costing structure which provides the benefit of accurately determining cost of both essential and nonessential programs. The importance of program costing at all levels of decision-making was discussed in detail in Chapter V. Critical mass levels below which performance should not fall can be determined for programs central to the primary mission of the organization [Jones 1984, p. 56]. Programs on the fringe of the organization's responsibilities should be reviewed for elimination if program cuts become necessary. The savings to be gained through elimination of

low priority programs should be accurately computed due to the definition of G-R-H cutback targets and the relatively short response time available to achieve the desired results. An alternative to cutting programs not central to the mission of the P-3 program is to charge requesting activities for the cost of the flights [Byrne 1987]. Implementing this sort of option also would require better cost information for programs and well-established priorities for budget reduction.

A military organization's public status generates a set of problems not found in a private sector company. The lack of a profit motive, lack of competition in a free market, and the difficulty of measuring outputs creates difficult management problems. Performance indicators of efficiency and effectiveness are hard to derive and evaluate. The warning signals of problems in performance that are provided by the ability to measure a profit are not available in most military organizations. The rapid turnover in leadership positions also dilutes the ability to provide a focus for a military organization. A lack of focus creates an opportunity for miscellaneous programs to enter the responsibility network of the organization. Because procurement of additional weapons platforms is so expensive, the P-3 has been targeted frequently for increased responsibilities. Its size and long range make it adaptable to a number of different missions. The first problem is

that missions are added without cost impact considerations. Second, there does not appear to be any hard-headed review process to eliminate programs. Extended fiscal stress requires a review of programs, their cost, and their priority within the organization.

D. ACCOUNTING AND FINANCIAL MANAGEMENT INFORMATION

There is general agreement in the literature on budgeting and financial management of the need for increased emphasis on cost containment during periods of fiscal stress. Managers look to accounting and financial management systems as a source of information for decision making and control. GAO reviews of the government's accounting and financial management information systems indicate that proper information often is not generated by existing systems [U.S. General Accounting Office, p. 1]. The GAO report noted that, "Today's financial reports provide a flood of information. All too often, the financial data in those reports are inconsistent, incomplete, unreliable, and untimely." [U.S. General Accounting Office 1985B, p. 1] The Comptroller General acknowledged in a July 1987 report to the Senate Committee on Government Affairs that,

...billions of dollars are being spent on uncoordinated efforts to upgrade accounting and financial management systems, but these efforts have routinely failed to meet their objective. I am concerned about our government's inability to effectively hold federal managers accountable for their financial activities, generally because we lack

essential financial data. [U.S. General Accounting Office 1987E, p. 1]

Further, the importance of having an effective financial management information system may not be appreciated until constrained resources require difficult economic choices. Decisions made when resources are plentiful often do not require effective systems because higher margins for error were available in making decisions.

GAO reports on the redesign of financial information and accounting systems support the concept of a budget organized by programs instead of object classes [U.S. General Accounting Office 1985B, p. 32]. This is one of the focal points of this thesis and is supported by DOD as well as the GAO. The GAO envisions a "roll-up" of planned and actual expenditures according to transaction-coded programs [U.S. General Accounting Office 1985B, p. 32]. The system would start at the lowest level of management control, a program element, and then would be summarized into larger categories at each level in the chain of command. One of the major problems that GAO identifies is that, "The budget is normally prepared on a program basis while the accounting is generally done on an organizational and object class basis." [U.S. General Accounting Office 1985B, p. 13]

This thesis demonstrates the extent to which this is true for the P-3 flight hour program. The primary P-3 report is the Budget OPTAR Report (BOR), which is expressed strictly in an object class format.

Programs are summarized in a separate reporting system, but there is no comparison of this data to the flight hour budget formulation model--PMR. Such a comparison would enable the determination of variances and would thus support more realistic and meaningful budgeting. PMR appears currently to be used only as a rough anchor point for flight hour budget formulation and execution rather than a useful financial management control instrument. The current PMR model is reviewed approximately every four years to see if its assumptions remain valid. The model assumes that squadrons spend specific amounts of flight time on individual programs to meet readiness and training requirements. The opportunity to compare the resources that the model assumes are devoted to training and readiness programs with what is actually happening can be obtained through collection and analysis of program data as indicated. The differences between planned resource expenditures dictated by the model and actual program expenditures may be examined to determine if the resources of the squadrons need to be redirected to meet the model, or if the model needs to be changed.

The current PMR model may prove beneficial in determining the critical mass level for programs that are essential to readiness and training. Previous flight hour funding levels and the readiness achieved also may help determine the critical mass level for programs. Funding

based on PMR uses 52 flight hours per crew per month. This aggregate is not detailed enough to compare the planned with the actual. The important parts of PMR are the programs that support the aggregate. Program-based accounting would allow the comparison of specific programs within the PMR model, such as pilot training, tactical training, mining, instrument training, etc., to what is actually being performed and consumed in the squadrons. Knowledge of resources consumption for programs, the critical mass levels required for each program, and the current readiness status of squadrons is a prerequisite for more accurate prediction of the impact of flight hour cuts on squadron readiness. A budget formulation model based on current information also would provide more certainty in negotiation for budget requirements. Better knowledge of program cost, critical mass levels and priorities will enable more successful adaptation to budgetary uncertainty over the next five years.

The primary advantage of better cost information is that it reduces uncertainty [Davis and Olson 1985, p. 205]. However, determination of the proper information to be collected in a financial management information system is one of the more difficult problems in creation of an effective system. Management information specialists generally agree that there is an enormous amount of irrelevant data collected. Many organizations collect data

because, "...information use is a symbol of commitment to rational choice." [Davis and Olson 1985, p. 256] Information collected should be used in proactive decision-making instead of providing defensive support to justify the organization's existence or providing a symbol of commitment to rational choices. Collecting information and not using it for decision-making or collecting the wrong information supports the Comptroller General's comment on the wasting of billions of dollars on the creation of ineffective systems. Hopwood also notes that, "The tendency for accounting over time to emphasize the procedural and the routine, to the detriment of the managerial and the strategic, has recently been recognized as a problem." [Hopwood (undated), p. 184]

E. CPWP EVOLUTION OF MANAGEMENT SYSTEMS

CPWP is taking positive steps in establishing a program structure for decision-making. The information on the hours dedicated to programs is already being collected. However, the accuracy of program costing could be improved by using the cost per hour for each mission profile instead of the annual funded cost per hour. The annual average cost is deficient for program costing because: (1) it includes both ground operations and flight operations, and (2) the variation in program cost per hour could be significantly different than the average. More accurate program costing will help decision-makers at CPWP with choices if program cuts become necessary. As discussed in Chapter V, if CPWP

used program information from all 12 squadrons, it could create a baseline from which squadron commanding officers could evaluate their allocation of resources across mission areas. Once a standard is established for allocation of resources to particular programs and mission areas, the opportunity for effective use of variance analysis becomes available. Variance analysis would enable cost per hour evaluation for programs and also evaluation of the allocation of resources to a particular program. Establishing such standards would require an extensive data base, but also will improve the management control system.

Collection of costing information for programs will require a standardized, transaction-coded management information system. As indicated in this thesis, numerous technical and organizational obstructions are present in creating and implementing an improved control system. The system must show benefits for the end-users and top management should be directly involved for effective implementation. The Comptroller General's frustration over the lack of results from administrative actions to improve financial management information systems resulted in the request for legislative action [U.S. General Accounting Office, p. 1]. The high turnover rate and lack of continuity in government generally, and in military leadership positions also is a detriment to implementing

lasting financial management control changes [U.S. General Accounting Office 1987E, p. 4].

Squadrons under the control of CPWP have the hardware available to collect improved program cost information, but training in the use of computers and their capabilities is lacking. Effective implementation is possible if the information system can be used with minimal training, if this training need is met, and if the system includes the ability to meet all flight hour reporting requirements.

F. RECOMMENDATIONS

Based on the arguments in this thesis, the following actions are recommended:

1. CPWP should continue with their efforts to more accurately determine the resources being devoted to the various missions in the VP force. The information on hours devoted to specific programs is already available; therefore, the relative percentage of resources allocated to programs could be determined.
2. Using the average hours allocated to programs, a baseline could be created to update the budget formulation model--PMR. This information could provide a meaningful model for commanding officers to evaluate their allocation decisions. This also helps CPWP in deciding whether the current distribution of resources among programs is compatible with the organization's priorities.
3. To provide the flexibility necessary to respond to a volatile budgetary process, more accurate program costing is needed. This would require the establishment of an improved financial information system for collecting the necessary data. This can be achieved through management information system contractors or if funds are not available, be initiated in-house using higher generation software. Students in the Naval Postgraduate School computer science curriculum could assist in the development as part of their thesis research.

4. A model for determining flight efficiency should be developed for operational flights from each of the deployment sites. This would provide an improved prediction system for planning individual flights, planning resource allocations, and for measuring the efficiency of individual flights.
5. A coding system should be developed along with the information system to facilitate program costing and required reporting of flight hour expenditures.
6. Once program information is available, a cost-benefit analysis should be done to see if the purchase of additional ground support equipment is justified.

G. SUGGESTIONS FOR FURTHER RESEARCH

The following topics appear to require further research:

1. Development of a financial information system for implementation at the squadron level. This is a prerequisite for improving the collection of program costing information and is a realistic thesis project for students in the computer science curriculum.
2. The data base of flight hours collected at CPWP should enable the computation of hours of flight time devoted to programs. This research would provide a standard for resource allocation to programs in the squadron.
3. The development of fuel usage models for different programs would provide a better planning tool for operations personnel, would provide a better measurement of efficiency for pilots, and with a large enough sample would enable the determination of program cost with just knowing the hours flown.
4. A cost-benefit analysis of ground support equipment versus use of the aircraft's APU may prove that the purchase of more ground equipment is financially sound.
5. Follow-up on G-R-H and its impact on defense is an issue that deserves further attention.

APPENDIX A

GLOSSARY OF ACRONYMS

APF	Annual Planning Figure
APU	Auxiliary Power Unit
BOR	Budget OPTAR Report
CNAP	Commander, Naval Air Forces, U.S. Pacific Fleet
COMPATWINGTEN	Commander, Patrol Wing TEN
COMPATWINGTWO	Commander, Patrol Wing TWO
CPH	Cost per hour
CPWP	Commander, Patrol Wings U.S. Pacific Fleet
DOD	Department of Defense
FAADCPAC	Fleet Accounting and Disbursing, Pacific
FHP	Flight Hour Program
G-R-H	Gramm-Rudman-Hollings Act
GPH	Gallons per hour
MP,N	Military Pay, Navy
O&M,N	Operations and Maintenance, Navy
OFC	OPTAR Function Category
OFC-01 Funds	Flight Hour Funds
OFC-50 Funds	Aviation Fleet Maintenance Funds
OPTAR	Operating Target

APPENDIX B

P-3 FLIGHT PROGRAMS/MISSIONS

<u>Major Category</u>	<u>Subcategories</u>	<u>Number of Program Elements</u>
TRAINING	ASW	3
	Pilot Training	9
	Non-Pilot	2
	Weapons	2
	Maintenance/Misc.	3
	Subtotal	19
EXERCISES	FLTEX/COOPS	9
	Combined Exercises	7
	Subtotal	16
OPERATIONAL	ASW	1
	SSSC	5
	SPEC. OPS.	2
	Repositions	2
	Subtotal	10
SERVICES	MEDEVAC & SAR	2
	RDT&E	1
	Miscellaneous	7
	Subtotal	10

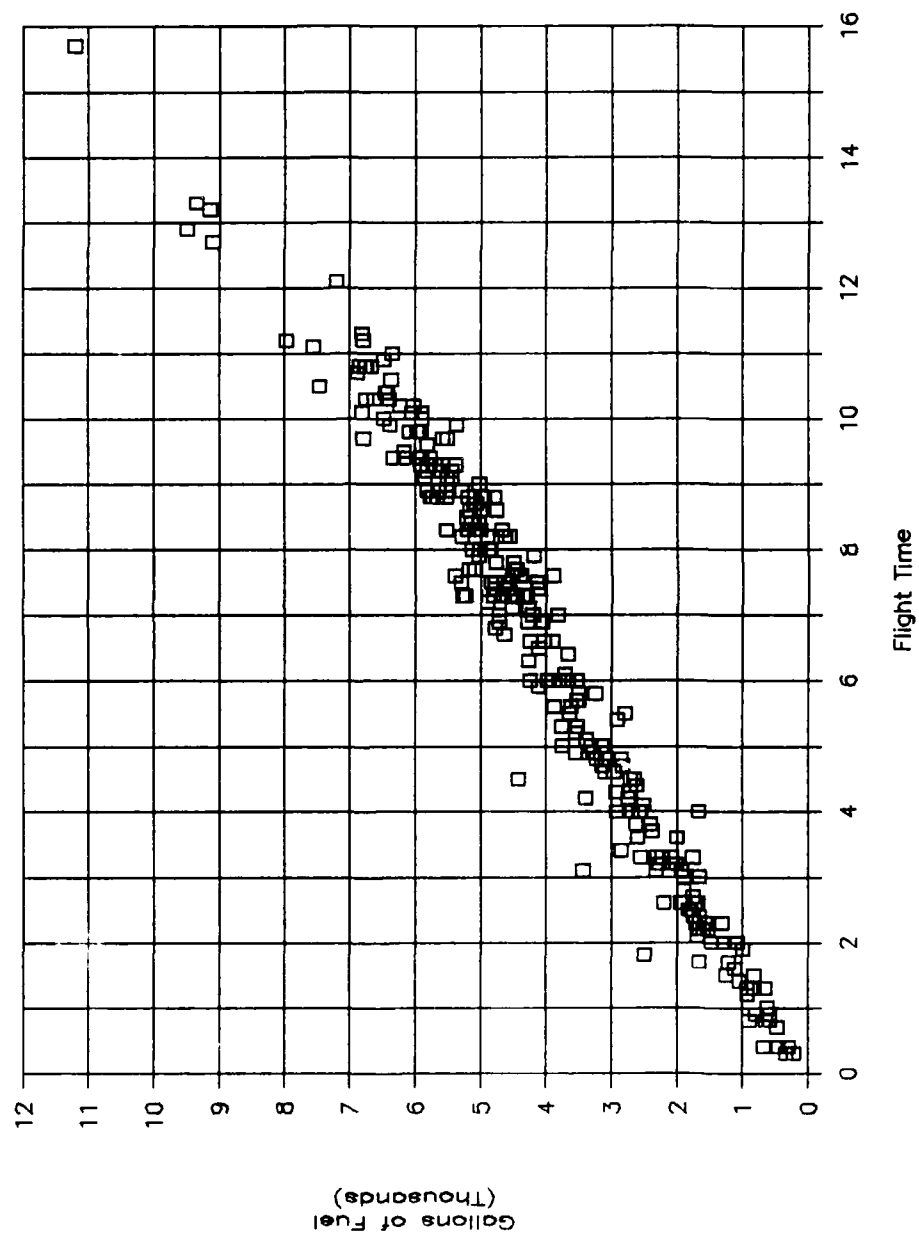
CONTINGENCY—— When Assigned 1
OPS

Subtotal	1
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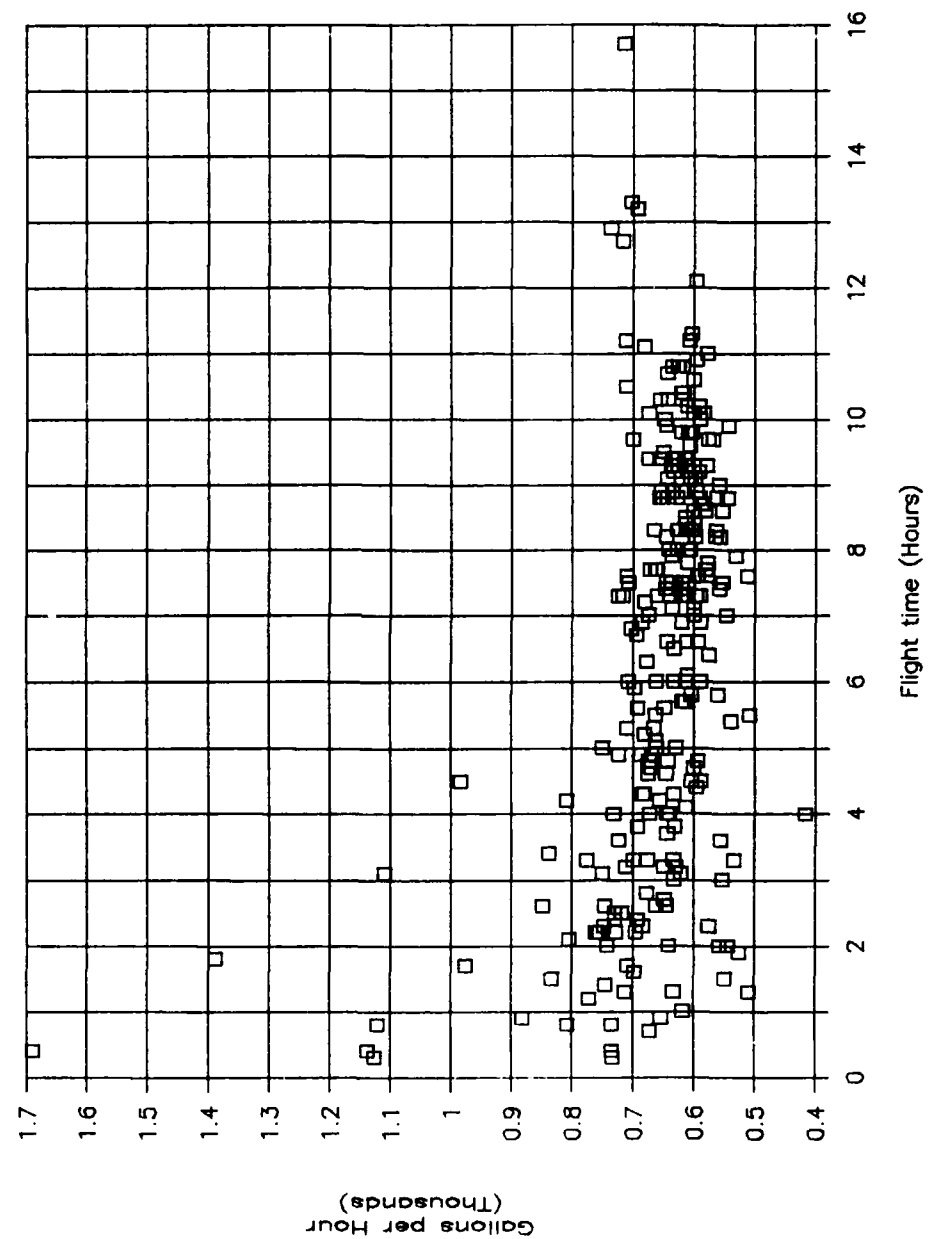
Total Categories	Total Subcategories	Total Program Elements
5	15	56

APPENDIX C
GRAPHS OF FUEL USAGE

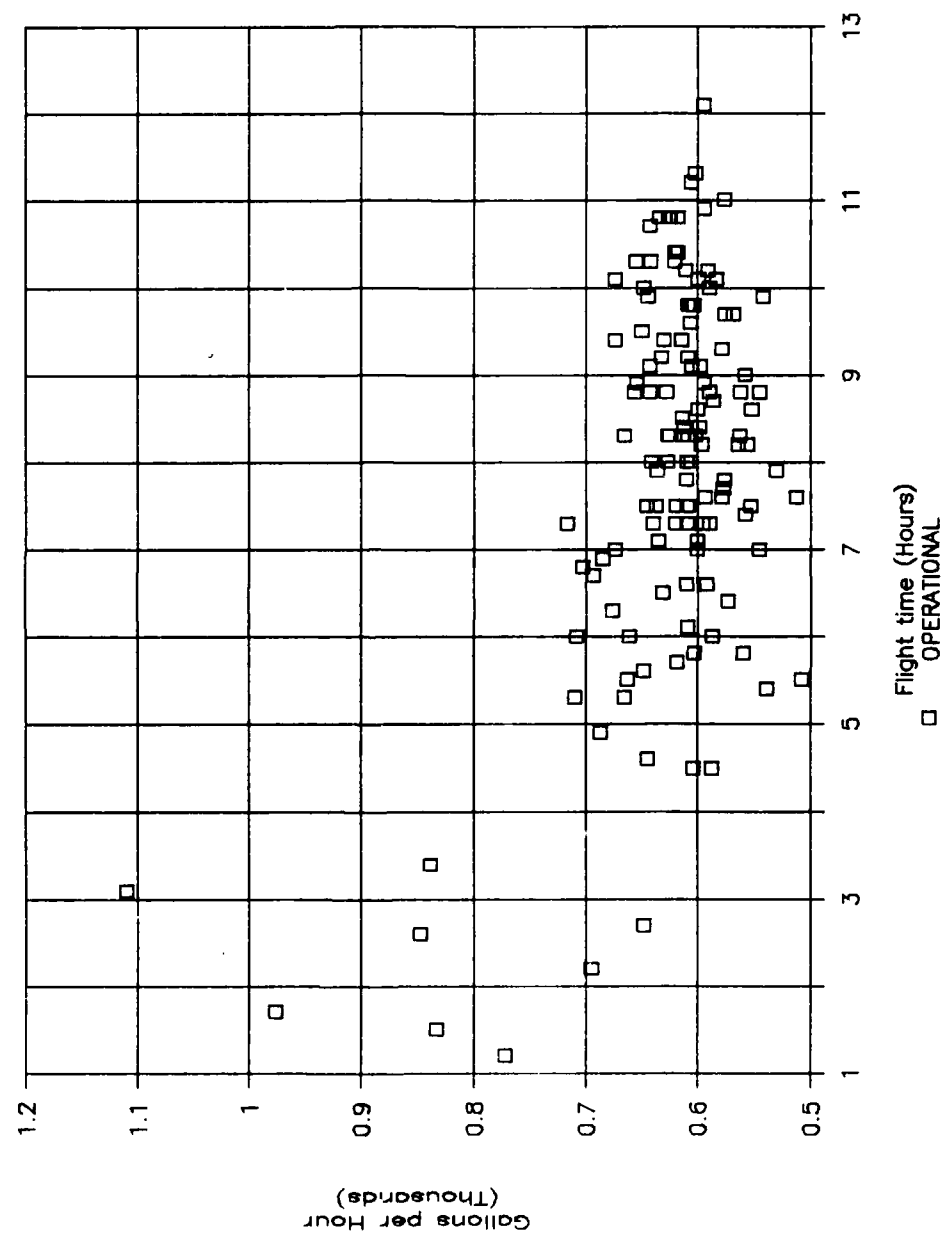
P3-C Fuel Usage



P3-C Fuel Usage



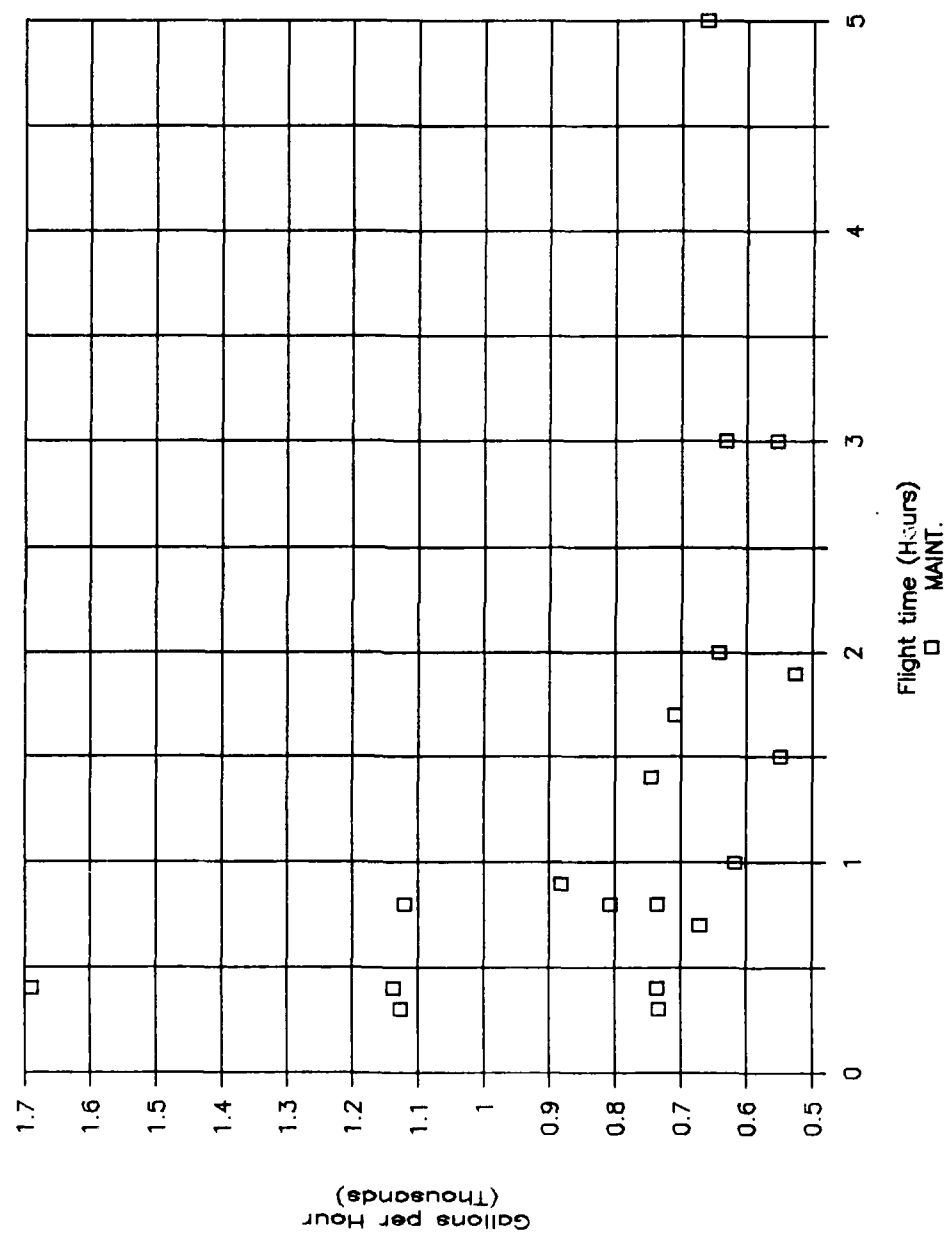
P3-C Fuel Usage



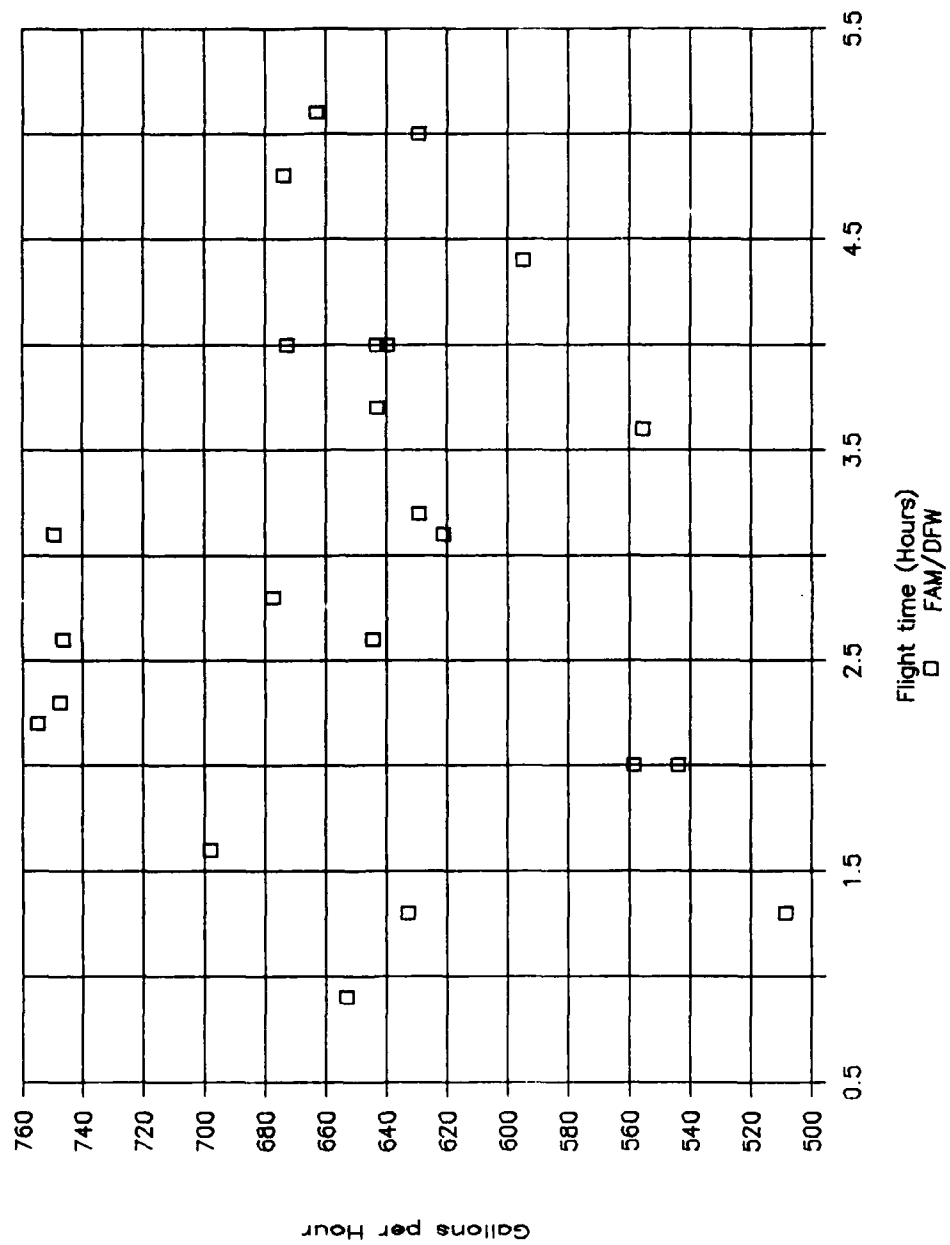
A scatter plot showing the relationship between Gallons per Hour (Thousands) on the Y-axis and Flight time (Hours) on the X-axis for SURVEILLANCE missions. The Y-axis ranges from 0.5 to 1.4 in increments of 0.1. The X-axis ranges from 1 to 11 in increments of 2. The data points are represented by open squares. The plot shows a general downward trend, with fuel consumption decreasing as flight time increases, though there is significant scatter. A legend on the right indicates the data is for 'SURVEILLANCE'.

Flight time (Hours)	Gallons per Hour (Thousands)
1	1.40
2	0.73
3	0.71
3	0.72
4	0.63
4	0.65
5	0.62
5	0.64
5	0.66
6	0.61
6	0.62
6	0.63
6	0.64
6	0.65
6	0.66
6	0.67
6	0.68
6	0.69
6	0.70
6	0.71
6	0.72
6	0.73
6	0.74
6	0.75
6	0.76
6	0.77
6	0.78
6	0.79
6	0.80
6	0.81
6	0.82
6	0.83
6	0.84
6	0.85
6	0.86
6	0.87
6	0.88
6	0.89
6	0.90
6	0.91
6	0.92
6	0.93
6	0.94
6	0.95
6	0.96
6	0.97
6	0.98
6	0.99
6	1.00
6	1.01
6	1.02
6	1.03
6	1.04
6	1.05
6	1.06
6	1.07
6	1.08
6	1.09
6	1.10
6	1.11
6	1.12
6	1.13
6	1.14
6	1.15
6	1.16
6	1.17
6	1.18
6	1.19
6	1.20
6	1.21
6	1.22
6	1.23
6	1.24
6	1.25
6	1.26
6	1.27
6	1.28
6	1.29
6	1.30
6	1.31
6	1.32
6	1.33
6	1.34
6	1.35
6	1.36
6	1.37
6	1.38
6	1.39
6	1.40
7	0.60
7	0.61
7	0.62
7	0.63
7	0.64
7	0.65
7	0.66
7	0.67
7	0.68
7	0.69
7	0.70
7	0.71
7	0.72
7	0.73
7	0.74
7	0.75
7	0.76
7	0.77
7	0.78
7	0.79
7	0.80
7	0.81
7	0.82
7	0.83
7	0.84
7	0.85
7	0.86
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7	0.92
7	0.93
7	0.94
7	0.95
7	0.96
7	0.97
7	0.98
7	0.99
7	1.00
7	1.01
7	1.02
7	1.03
7	1.04
7	1.05
7	1.06
7	1.07
7	1.08
7	1.09
7	1.10
7	1.11
7	1.12
7	1.13
7	1.14
7	1.15
7	1.16
7	1.17
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7	1.26
7	1.27
7	1.28
7	1.29
7	1.30
7	1.31
7	1.32
7	1.33
7	1.34
7	1.35
7	1.36
7	1.37
7	1.38
7	1.39
7	1.40
8	0.59
8	0.60
8	0.61
8	0.62
8	0.63
8	0.64
8	0.65
8	0.66
8	0.67
8	0.68
8	0.69
8	0.70
8	0.71
8	0.72
8	0.73
8	0.74
8	0.75
8	0.76
8	0.77
8	0.78
8	0.79
8	0.80
8	0.81
8	0.82

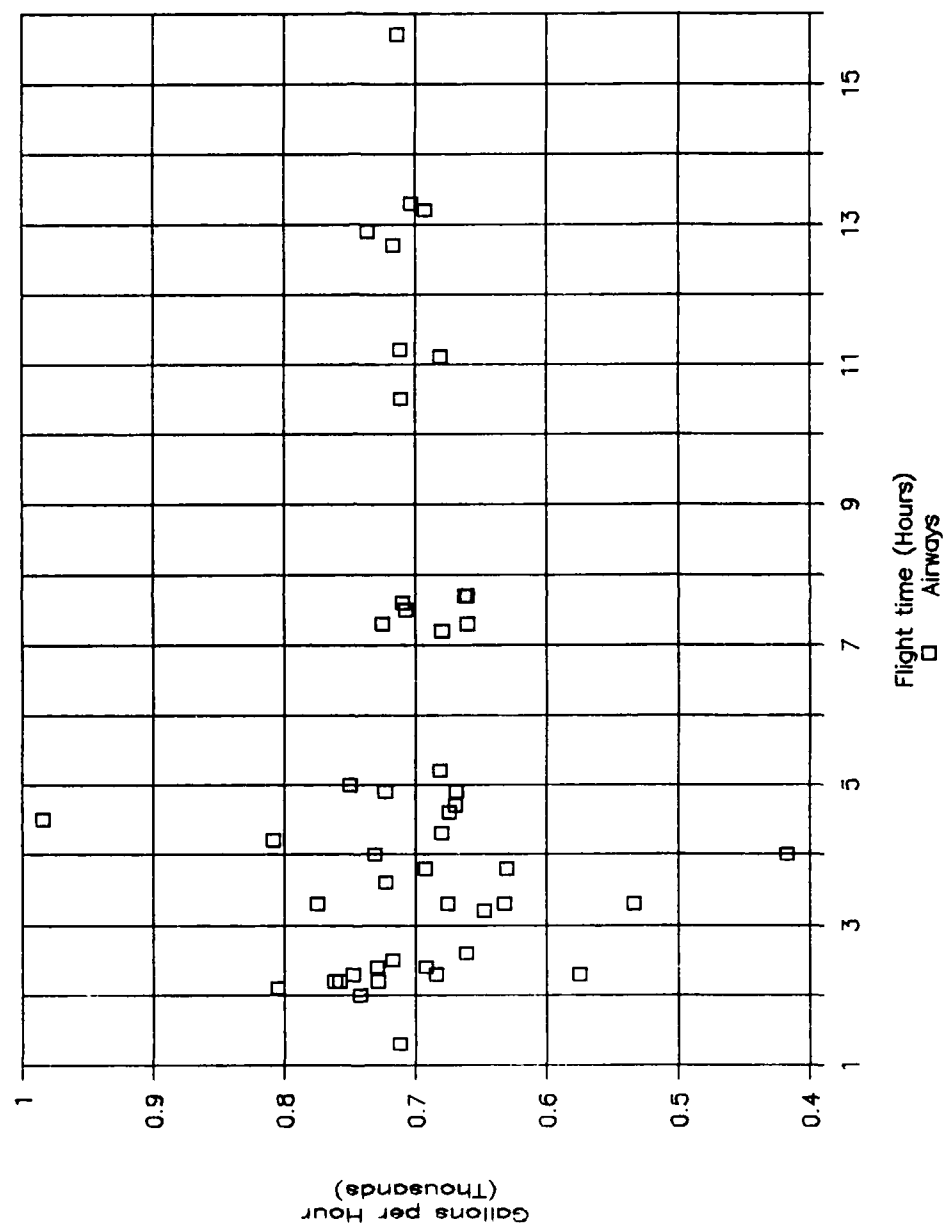
P3-C Fuel Usage



P3-C Fuel Usage



P3-C Fuel Usage



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